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PREFACE

There are many approaches to the study of Byzantine architecture, probably as many as there are scholars with an interest in the material. My own interest as a practicing architect and trained art historian begins with a concentrated analysis of individual monuments, and expands from there in an attempt to organize and to understand the bewildering number of forms and examples. While in some recent investigations Byzantine buildings are seen primarily as documents which provide evidence of Byzantine civilization, my own interest focuses above all upon the buildings themselves, using what we know of Byzantine civilization as one approach, among many others, which will lead to a varied, complex and multifaceted understanding of Byzantine architecture.

Naturally, I am particularly intrigued by how Byzantine architects may have approached their design projects. As different as their attitudes and training must have been to those of today's architects, there can be no doubt that there is an overlap of interests, probably ranging from every day problems like laying out, dimensioning, proportioning and constructing buildings, to questions of how to articulate surfaces and formulate space.

The study of each Byzantine building, and of Byzantine (and other) architecture in general constitutes an exploration into the history of ideas: ideas concerning not only how surfaces may be articulated and spaces formulated, but also ideas on how new forms are generated, evolved or developed, and on why certain forms are chosen rather than others. Interest in historic buildings cannot be limited to how buildings were constructed, nor even to what the impact of social, economic and political forces may have been; rather, ideally all of the many layers of activity and thought which produced the forms, including some which are difficult to grasp or intangible must be explored.

It is obvious that each work of architecture reflects, in some way, essential elements of the individuals, the society and the entire civilization involved in the building's realization. One purpose of studying historic buildings is surely to attempt to identify such interdependencies, realising, at the same time, that here we are on the slippery grounds of speculation. On the other hand, speculation has been and remains one of the mainstays of the social and natural sciences, and there is no reason to avoid it once we acknowledge its limitations. The alternative, in the study of historic buildings, is to constrict ourselves to descriptions of monuments and materials. As in other fields of investigation, after new arguments are presented or additional evidence accrues, the proposed theories will be substantiated, revised or discarded.

The essays collected in this volume are divided into three parts which reflect the concerns outlined above. Within each part they are organized chronologically according to the period of the material being investigated, rather than when the articles were initially published.

Part one contains analyses of individual buildings ranging from such well known examples as St Sophia in Istanbul to the Church of St John the Theologian in Alaşehir and to Church E in Sardis, both of which were previously unpublished. The emphasis of each study differs. While the essay on St Sophia evaluates the building within the broad context of Byzantine architecture, that on the Church of St John concentrates upon a description of the remains, and upon the reconstruction of this large and unusual church with two domes over its nave. A detailed account of the reconstruction of Church E in Sardis will be published in the forthcoming volume *The Churches of Sardis* (Harvard University Press); it was built on an inscribed cross plan with one central and four corner domes. The study of the church included in this volume places the forms of the building into their architectural and political setting, and demonstrates that the church must have been constructed during the rule of the Lascarid dynasty in the thirteenth century. Church E appears to have been designed using the *quadratura*, a geometric system of proportions which was previously known only in Western architecture.

In part two architectural forms of Byzantine Asia Minor are considered, partly as an expansion of research presented in part one. In chapter IV dimensional 'rules of thumb' and modular systems of proportion are explored, which were probably used in the design of Byzantine basilicas. Chapter V summarizes and evaluates the most important stylistic currents in Asia Minor throughout the Byzantine period, linking some to currents in other parts of the Empire, and others to the political and economic history of the area. Work on Church E in Sardis led to the identification of the architectural style typical of buildings constructed in Asia Minor and off-shore islands by the Lascarid dynasty. Numerous buildings and the dominant characteristics of this varied and richly decorative style are described in chapter VI, together with possible reasons for the use of some of the forms and a brief account of how the political history may help to date the buildings.

More general questions of style and meaning are posed in part three. Chapter VII, an English translation of the original German text, raises questions concerning the use of stylistic and other forms of analysis, and organizes Byzantine architectural examples in four comprehensive stylistic currents. In chapter VIII, previously unpublished, the goals and achievements of Byzantine architects, when they transformed older, existing buildings such as Ancient temples, Byzantine basilicas or medieval churches, are examined and compared. Chapter IX describes and explores the style of early Byzantine churches, and distinguishes it from the styles common in preceding and later buildings. Chapter X considers the most important issues useful in evaluating churches attributed to the obscure period between the late-sixth century and the early ninth; it is partly based upon my

previous work on the Church of the Archangels in Kumyaka (formerly Sige). A very different approach is used in chapter XI, which explores the use of geometry in medieval Byzantine churches, posing the questions how and why stereometric Euclidean geometry was used, and whether there was ultimately a Platonic connection.

HANS BUCHWALD

Stuttgart
October 1998

PUBLISHER'S NOTE

The articles in this volume, as in all others in the Variorum Collected Studies Series, have not been given a new, continuous pagination. In order to avoid confusion, and to facilitate their use where these same studies have been referred to elsewhere, the original pagination has been maintained wherever possible.

Each article has been given a Roman number in order of appearance, as listed in the Contents. This number is repeated on each page and is quoted in the index entries.

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I

Saint Sophia, Turning Point in the Development of Byzantine Architecture?

The Church of St. Sophia in Constantinople has been thought of as the supreme achievement of all Byzantine architecture[1]. However, that designation is more appropriately applied to the inscribed cross church type. The forms of inscribed cross churches were inseparable from the monumental images which, together with the architecture, reflected in space the symbolism, and the hierarchy of Byzantine religious, social and political structures. It amalgamated geometric and earlier architectural forms in a complex, yet immediately comprehensible, completely harmonious composition. The inscribed cross church type found almost universal recognition within the Empire for several centuries and was, apparently, used for all purposes by all levels of society[2]. Many of these qualities are clearly not present in St. Sophia (Figs. 1-4).

What, then, was the importance of St. Sophia in Byzantine architecture, and by which criteria may it be measured? What are the primary skills, approaches, or goals reflected in its design? Although much has been written about the church, I believe that a review of these questions may lead to new insights.

- The original title of the lecture which presented the core of the ideas in this paper was *Die Sophienkirche als Wendepunkt der byzantinischen Kunstgeschichte?*

1 This appears to be the general consensus, and is expressed, for instance, in: Cyril Mango, *Architettura Bizantina*, Milan, 1978, p. 107; Mango, *Byzantine Architecture*, 1st paperback ed. London, 1986, p. 59.

2 Hans Buchwald, 'The Geometry of Middle Byzantine Churches and Some Possible Implications', in: *Jahrbuch der Österreichischen Byzantinistik*, 42, 1992, pp. 293-321, for a detailed description of this church type and its exceptional qualities. Other, less accurate terms are also used, for instance *cross-in-square* (many examples are not square), *four column* (examples with two or six columns, or piers, exist) and *quincunx*, (a geometric arrangement of 5 objects within a rectangle, which is irrelevant to most inscribed cross churches).

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I

Our consideration of St. Sophia will be divided into two discrete parts, one dealing with the capitals, the other with the major architectural forms. The difference is not academic, but essential to an understanding of the building within the development of Byzantine architecture, because the capitals appear to represent the culmination, though not the «cutting edge» of an important development, while the major forms may better be interpreted as a new impetus.

1. Capitals

The general outline of the development of capitals in the first three centuries of Christian monumental architecture is well known, even though many questions remain open[3]. The relationship between the capitals and the architecture for which they were produced, or within which they were reused as spoils, has received much less attention. My purpose here is to define the capitals of St. Sophia within that relationship.

It is an anomaly of this period, that the forms of the capitals were seldom in keeping with those of the architecture. The simple, stereometric, pristinely geometric forms used in major Christian buildings of the 4th and 5th centuries[4], were usually accompanied by capitals based directly upon Ionic, Corinthian or composite types developed, for the most part, several centuries earlier for buildings which were entireby different in appearance (Figs. 5, 6). It is incon-

3 Particularly: Rudolf Kautzsch, *Kapitellstudien. Studien zur spätantiken Kunstgeschichte*, Berlin, 1936; Friedrich W. Deichmann, *Studien zur Architektur Konstantinopels im 5. und 6. Jahrhundert*, Baden Baden, 1956, pp. 56-95; Ernst Kitzinger, *Byzantine Art in the Making*, London, 1977, pp. 76-80; Christine Strube, *Polyeuktoskirche und Hagia Sophia. Umbildung und Auflösung antiker Formen. Entstehen des Kämpferkapitells*, Munich, 1984; Eunice D. Maguire, 'Range and Repertory in Capital Design', in: *Dumbarton Oaks Papers*, 41, 1987, pp. 351-359, with extensive further references.

4 I have attempted to describe this style in: Hans Buchwald, 'The First Byzantine Architectural Style. Evolution or Revolution?', in: *Jahrbuch der Österreichischen Byzantinistik*, 32/5 (Akten XVI. internationaler Byzantinistenkongress II/5), pp. 33-45; Hans Buchwald, 'Der Stilbegriff in der byzantinischen Architektur', in: *Jahrbuch der Österreichischen Byzantinistik*, 36, 1986, pp. 303-316.

sequential, when evaluating the relationship between the capitals and the buildings in which they were placed, that some capitals in 4th and 5th century churches were reused spoils, and others were manufactured by contemporary workshops[5].

Why did architects and patrons continue to accept the striking discrepancy between the innovative, new, stereometric forms of the architecture and the traditional, antiquated, organic forms of the capitals for at least two centuries? The answer is necessarily speculative because of the lack of documentary evidence. However, I think that lack of ability, lack of funds, and lack of ingenuity may safely be ruled out. Numerous examples of buildings constructed between the early 4th century and the early 6th were of high quality and built, detailed and executed with complete competence, at times obviously at considerable expense. We may assume that Constantine's architects and sculptors could have created new forms for capitals and other decorative features if they had wanted to, or had been commissioned to do so. After all, they had boldly created new building types and a new architectural vocabulary, even though, as in all new styles, earlier buildings and stylistic features were referenced.

Rather, it seems more probable that ancient capitals were reused as spoils, or imitated, in deference to Antiquity and its cultural achievements. Capitals were architectural features which, unlike temples, did not have connotations relating them to ancient divinities or worship. They represented the achievement of design perfection in Antiquity, and were a focal point in the development of Classical architecture. They provided the strongest single component which could tie new Christian buildings to the ancient, and still respected traditions, without the stigma of abhorrent religious practices. Of course, the fact that capitals from ancient buildings were frequently available for use as spoils in cities around the Mediterranean also must have been an impetus to their use in Christian buildings, but it

5 For the use of spoils in Byzantine architecture: Friedrich W. Deichmann, *Die Spolien in der spätantiken Architektur* (Sitzungsberichte der Bayerischen Akademie der Wissenschaften, Philosophisch-historische Klasse, Heft 6), München, 1975; Beat Brenk, 'Spolia from Constantine to Charlemagne. Aesthetics Versus Ideology', in: *Dumbarton Oaks Papers*, 41, 1987, pp. 103-109.

cannot alone explain their widespread continued use, and imitation, until the 6th century and later[6].

Numerous changes in the forms of capitals have been traced between the late 4th century and the 6th[7]. Classical aspects were transformed in many ways. However, the transformation and undermining of Classical forms alone did not necessarily tie the capitals more fully into the stereometric system of the architecture. The discrepancy between the geometric forms of the architecture and the organic forms of the capitals was not fully resolved before the 6th century. We will consider that resolution in terms of three distinctive aspects: 1.) the body of the capital; 2.) the surface articulation; 3.) references to forms of Antiquity.

Two capital types are prominent in St. Sophia. Type A has a bowl with monogrammed bosses, a torus at the bottom, and Ionic volutes and a low frieze at the top. It is used in the nave arcades at both levels, and in the side aisles at ground level[8] (Fig. 7). Type B is more radical, and includes only a crisp, stereometric impost block with Ionic corner volutes at the bottom; it is used inside the galleries[9] (Fig. 8). The surfaces of both types are decorated by various flat, undercut, very regular geometric acanthus forms, as are many of the lower wall surfaces of the building.

Both capital types have predecessors[10], but no exact parallels earlier, and both must have been designed for the church. In both types the geometry of the body is emphasized as a minimalist transition between the seat of the arches above and the circular column top below. The complex, spring-like, organic transition between load and support provided by Classical capitals has entirely disappeared. In both capital types the Ionic volutes and flat, stylized acanthus are

6 See footnote 5 above for additional approaches to the use of spoils, which do not contradict the approach suggested here.

7 See footnote 3 above.

8 Rowland J. Mainstone, *Hagia Sophia*, New York, 1988, Figs. 57, 68; Strube, *Polyeuktoskirche und Hagia Sophia* (as footnote 3), Fig. 91.

9 Mainstone, *Hagia Sophia* (as footnote 8), Figs. 70, 74; Strube, *Polyeuktoskirche und Hagia Sophia* (as footnote 3), Figs. 95-98.

10 See particularly: Kautzsch, *Kapitellstudien* (as footnote 3); Kitzinger, *Byzantine Art in the Making* (as footnote 3); Strube, *Polyeuktoskirche und Hagia Sophia* (as footnote 3).

retained as vestiges of, and marks of deference to, the Classical decorative vocabulary. The volutes are skillfully fitted to the top or bottom to cover the points of contact between rounded and squared forms, without actually resolving the transition geometrically: pleasing appearance was sufficent. The volutes, tightly wound circular spirals, are attuned to the stereometric geometry which underlies the entire building; they are conceived in stark contrast to the complex geometry of the gently evolving, rhythmic evolutions in the Classical volutes which are their antecedents.

In St. Sophia, the capital forms are an integral part of the total architectural statement (Fig. 17). They are composed of the same taut geometry that is inherent and visible in all parts of the building. The undercutting provides a double shelled, diaphonous appearance reminiscent of the relationship between the nave and side aisles of the church (Fig. 19). The dematerialization of the marble achieved with undercutting, and the expression of transition between load and support in minimalist, geometric terms, were probably not primary objectives of the architects and sculptors. Rather, the major objective appears to have been to obtain unity in all components of the building by attuning the forms of the capitals to those inherent in the design of the entire church. The flat, regular, rhythmic chiaroscuro of the surface treatment on the capitals emphasizes their outer faces, pinpointing the planes of the basic stereometric geometry which defines them and all other features of the building.

In other, somewhat earlier examples, the clean minimalist transition between load and support is more radical, for it is achieved without the use of Ionic volutes. In the retention of Ionic volutes the capitals of St. Sophia are conservative for their time. The surface decoration of acanthus forms, rather than carved symbols, objects or geometric patterns also reflects a conservative, traditionalist attitude. A few selected examples serve to place the capitals of St. Sophia into their context.

Close similarities have been noted in the design of St. Sophia and that of Sts. Sergius and Bacchus, perhaps constructed slightly earlier[11].

11 The similarity has been noted by most authors dealing with St. Sophia, and is discussed in detail in: Mainstone, *Hagia Sophia* (as footnote 8), pp. 154 f.

In its galleries and elsewhere, impost capitals with Ionic volutes were used which are the same in form as those of St. Sophia (Fig. 9). Capitals used only at the south wall are more radical, for they lack Ionic volutes. In both capital types, however, the surface treatment contains extraneous components and has a frieze-like organization which lacks the rhythmic unity and surface continuity of the St. Sophia capitals. The capitals supporting the nave entablature at ground level, on the other hand, have a regular, rhythmic acanthus surface treatment similar to that found in St. Sophia, but their 8 bulbous components still echo the volumes of the acanthus leaves of their ultimately Corinthian prototypes[12] (Fig. 10).

Many of the capitals found in the excavation of St. Polyeuktos in Constantinople, built 524-27, are impost capitals which are more radical in design than those of St. Sophia: Ionic volutes are not apparent, and most motifs have little or nothing in common with those of traditional Classical examples (Fig. 11). The capitals have been reduced to a geometric minimum, and their surfaces are decorated with geometric and vegetal features which are unrelated to any in capitals of Antiquity. On the other hand, their surface details are frequently carved in a rich, rounded style with components which differ strikingly in scale; their surfaces therefore lack the taut geometry and rhythmic continuity of those in St. Sophia[13].

12 Thomas F. Mathews, *The Byzantine Churches of Istanbul. A Photographic Survey*, University Park: Pennsylvania State University Press, 1976, pp. 242f., Figs. 29-14, 29-16, 29-25, 29-26, 29-27, with basic information and a bibliography. The impost capitals without volutes in Sts. Sergius and Bacchus are currently not prominent, but may originally have flanked an entrance to the church from the south: Mathews, *The Byzantine Churches of Istanbul*, Fig. 29-29; Strube, *Polyeuktoskirche und Hagia Sophia* (as footnote 3), pp. 82, 91, for a discussion of the capitals and their relationship to those of St. Sophia, and further references. For the date of the building, see particularly: Strube, *Polyeuktoskirche und Hagia Sophia* (as footnote 3), footnote 410, and Cyril Mango, 'The Church of Sts. Sergius and Bacchus Once Again', in: *Byzantinische Zeitschrift*, 68, 1975, pp. 385-392; Cyril Mango, 'The Date of the Studius Basilica in Istanbul', in: *Byzantine and Modern Greek Studies*, 4, 1978, p. 115.

13 Martin R. Harrison, *Excavations at Saraçhane in Istanbul*, Vol. 1, Princeton: Princeton University Press and Dumbarton Oaks Research Library and Collection, 1986, pp. 126-129, 414- 418, Figs. 129-155; Mathews, *The Byzantine Churches of Istanbul* (as footnote 12), Figs. 26-4, 26-5; Strube, *Polyeuktoskirche und Hagia Sophia* (as footnote 3), pp. 61-80, for a detailed discussion of the capitals, including observations on their relationship to those of St. Sophia.

Examples from domed Basilica B in Philippi, attributed to the period immediately after the construction of St. Sophia, are very similar to those of St. Sophia. While the capitals attributed to the side aisles are the same as those of St. Sophia type A, most of the others are impost capitals without Ionic scrolls, pinpointing the conservatism of the St. Sophia solution[14] (Fig. 12).

Other Byzantine impost capitals, with and without Ionic volutes are found in Istanbul, Asia Minor, Greece, Italy, as reused spoils in San Marco in Venice and occasionally elsewhere[15] (Fig. 13). Most cannot be dated precisely, and whether they were carved before or after those of St. Sophia cannot usually be determined. With some exceptions, the dated examples are insufficient to provide exact chronologies using stylistic analysis, for we do not know how long the use of certain traits may have continued, and what the role of local or shop variations may have been.

The impact of the capitals of St. Sophia and closely related churches was limited. Although impost capitals were used frequently in the decades after the construction of St. Sophia, they do not seem to have prevailed. The union between the geometry of the buildings and that of their capitals often enough appears to have been less

14 Paul Lemerle, 'Basilique B ou Direkler', in: *Philippes et la Macédoine Orientale,* part 2, Paris, 1945, pl. 46, 47, 48 a.

15 For instance: Mathews, *The Byzantine Churches of Istanbul* (as footnote 12), Figs. 1-9, 1-10, 1-11, 1-13, 1-14 (Koca Mustafa Paşa Camii), 21-5, 21-6, 21-7 (Manastir Mescidi), 34-2 (Chalkoprateion), 35-22 (Fenara Isa Camii North Church), 36-30, 36-32 (Church of the Virgin Pammakaristos, Parecclesion); Gustave Mendel, *Catalogue des Sculptures, Grecques, Romaines et Byzantines,* III, Constantinople, 1914, Nos. 1235, 1236, 1239, 1240, 1241; Strube, *Polyeuktoskirche und Hagia Sophia* (as footnote 3), particularly pp. 81-80 and passim, with numerous illustrations; Friedrich W. Deichmann, Joachim Kramer, Urs Peschlow, *Corpus der Kapitelle der Kirche von San Marco zu Venedig,* Wiesbaden, 1981, with an overview pp. 151-153, and a sampling in Figs. 89-90, 99-100, 109-151, 299, 304, 309-313, 362-365, 372-373, 410-411, 418-420, 425, 432, 513-514, 528, 530, 598, 607, A3; Friedrich W. Deichmann, 'Die Expansion der Architektur Konstantinopels im fünften und sechsten Jahrhundert', in: *Rom, Ravenna, Konstantinopel, Naher Osten. Gesammelte Studien zur spätantiken Architektur, Kunst und Geschichte,* Wiesbaden, 1982, pp. 620-630; Deichmann: *Studien zur Architektur Konstantinopels* (as footnote 3), pp. 84-97; Ann Terry, 'The Early Christian Sculpture at Grado: a Reconsideration', in: *Gesta,* 26-2, 1987, pp. 93-112, Figs. 6-11; Raffaella O. Farioli, 'Capitelli bizantini di Ravenna', in: *Atti del 1. Congresso Nazionale di Studi Bizantini,* 1965, Ravenna, 1966, pp. 153-162, Pl. 45-50; *Die Johanneskirche* (Forschungen in Ephesos, IV-3), Wien, 1951, pp. 120-133, Pl. 28-33.

important than the use of capitals as a reference to Classical perfection. In some key examples acanthus capitals based upon Corinthian or composite types, and spoils from earlier periods seem to have been preferred (Fig. 14). San Apollinare in Classe, 534-49, is a case in point; its capitals are clearly based upon earlier variants of Corinthian and composite types[16] (Fig. 15). The same may be observed of other capitals which may be attributed to the 6th century in other parts of the Empire[17].

The capital types of St. Sophia do not appear to have been imitated in medieval churches in the capital. To the contrary, capitals appear to have been reused as a standard practice in Constantinople. Examples include the Church of St. John in Trullo[18], the Church of the Virgin of Constantine Lips (Fenara Isa Camii North Church)[19] (Fig. 16), the Myrelaion (Bodrum Camii) substructure[20], Kalenderhane Camii[21], Kilise Camii outer narthex[22], St. Andrew in Krisei (Koca Mustafa Paşa Camii)[23], the Church of Christ of the Chora Monastery (Kariye Camii)

16 Friedrich W. Deichmann, *Ravenna – Geschichte und Monumente*, Wiesbaden, 1969, Figs. 35-39, pp. 235- 261; Mario Mazzotti, *La basilica di Sant' Apollinare in Classe*, Vatican City, 1954; Mario Mazzotti, 'S. Apollinare in Classe, indagini e studi degli ultimi trentanni', in: *Rivista di archeologia cristiana*, 62/1-2, 1986, pp. 199-219; Giuseppe Cortesi, *Classe paleocristiana e paleobizantina*, Ravenna, 1980, pp. 39-86.

17 For instance: Kautzsch, *Kapitellstudien* (as footnote 3), passim; Friedrich W. Deichmann, 'Zur spätantiken Bauplastik von Ephesos', in: *Mansel'e Amargan*, Ankara, 1974; Howard C. Butler, *Architecture and Other Arts*, New York, London, 1904, pp. 27-29, for a broad overview of Syrian examples; Howard C. Butler, *Early Churches of Syria*, Princeton, 1929, pp. 113-171, for various 6th century examples; Christine Strube, 'Baudekoration in den Kirchen des nordsyrischen Kalksteinmassivs', in: *Archäologischer Anzeiger*, 1978, pp. 577-601; Christine Strube, 'Die Kapitelle von Kasr Ibn Wardan', in: *Jahrbuch für Antike und Christentum*, 26, 1983, pp. 59-106.

18 Mathews, *The Byzantine Churches of Istanbul* (as footnote 12), Fig. 16-11, with a basic bibliography, p. 159.

19 Mathews, *The Byzantine Churches of Istanbul* (as footnote 12), p. 323 for a bibliography, and Fig. 35-22; Arthur H. S. Megaw, 'The Original Form of the Theotokos Church of Constantine Lips', in: *Dumbarton Oaks Papers*, 18, 1964, pp. 279- 298, Fig. 13.

20 Cecil L. Striker, *The Myrelaion (Bodrum Camii) in Istanbul*, Princeton, N.J., 1981, Figs. 51-53, 15-16, description p. 27, dates the capitals about 460-480 based upon: Kautzsch, *Kapitellstudien* (as footnote 3).

21 Mathews, *The Byzantine Churches of Istanbul* (as footnote 12), Figs. 18-24, 18-25.

22 Mathews, *The Byzantine Churches of Istanbul* (as footnote 12), p. 387, for a bibliography, and Figs. 40-1, 40-13, 40-15, 40-16.

23 Mathews, *The Byzantine Churches of Istanbul* (as footnote 12), p. 4, for a bibliography, and Figs. 1-9, 1-10, 1-11, 1-13, 1-14.

Parecclesion[24], and the Church of the Virgin Pammakaristos (Fetiye Camii) Parecclesion[25]. The cited evidence is all the more convincing, because the major supports in many medieval churches of the city were altered in Turkish renovations which removed the original capitals. The spoils of the Fenara Isa (Fig. 16) and the Kariye are particularly telling because both churches are lavishly furnished, and in both there are excellent examples of medieval carving, indicating that spoils were used by choice and not by necessity.

While many of the spoils are impost types generally similar to those of St. Sophia and related churches, earlier types based upon Corinthian capitals were also reused frequently, at times in the same buildings. The frequent use of large impost capitals may have been influenced not so much by their use in St. Sophia or other important, earlier buildings, but rather, by their greater effectiveness as the seats of masonry vaults.

2. Spacial Impact – Scale – Engineering

An observation which has received insufficient consideration in discussions of St. Sophia is that its spacial impact depends largely upon its overpowering scale, and that its scale was made possible only by the excellence of its engineering technology. It would not be an exaggeration to interpret the building above all as a technological, engineering feat[26].

24 Mathews, *The Byzantine Churches of Istanbul* (as footnote 12), pp. 41f, for a bibliography, and Fig. 8-26; Oeystein Hjort, 'The Sculpture of the Kariye Camii', in: *Dumbarton Oaks Papers*, 33, 1979, pp. 203-289, Figs. 57-60.

25 Mathews, *The Byzantine Churches of Istanbul* (as footnote 12), p. 347, for a bibliography, and Figs. 36-30, 36-32.

26 For recent structural analyses see particularly: Mainstone, *Hagia Sophia* (as footnote 8), pp. 67-83, with references to his earlier investigations; Shiro Kato, Takayoshi Aoki, Kenichiro Hidaka, H. Nakamura, 'Finite-Element Modelling of the First and Second Domes of Hagia Sophia', in: *Hagia Sophia from the Age of Justinian to the Present*, Robert Mark, Ahmet S. Çakmak (ed.), Cambridge: Cambridge University Press, 1992, pp. 103-119; Robert Mark, Ahmet S. Çakmak, Mustafa Erdik, 'Preliminary Report on an Integrated Study of the Structure of Hagia Sophia: Past, Present, and Future', in: *Hagia Sophia from the Age of Justinian to the Present* (as above), Mark, Çakmak (ed.), pp. 120-131.

I

The overwhelming spacial impact of Saint Sophia is extraordinary and is surely the primary quality, upon which its evaluation has usually been based (Fig. 3, 18, 19). That impact alone assures the building a solid place among the most important monuments of architectural history. Everything else that we know about it is secondary: without the awesome impact, it would probably be of interest primarily to a small group of specialists.

Certainly the size of Saint Sophia is central to its spacial impact. To be sure, the lighting effects, the color, the detailing, the diaphonous relationship between central and perimeter spaces, the rhythm of curved volumes, the concentration of forms toward the central cupola (Fig. 3, 18, 19), and what we know about the boldness of its conception and implementation all add to our esteem of the building. But many of these features are also valid for other roughly contemporary monuments, for instance, San Vitale in Ravenna and Sts. Sergius and Bacchus in Istanbul[27]. If St. Sophia were the size of Sts. Sergius and Bacchus, it would probably receive no more attention than that venerable monument. Vice versa, if Sts. Sergius and Bacchus had been constructed with a dome equal in size to that of St. Sophia, it would receive equal attention and esteem (Fig. 20).

The latter supposition is revealing because both churches were built in the same city at roughly the same time, conceivably by the same workmen and even by the same designers[28]. The similarity between the three eastern and three western bays of Sts. Sergius and Bacchus and the equivalent bays of St. Sophia is striking and obvious. The scheme of Sts. Sergius and Bacchus appears not only to have been known to the architects of St. Sophia, but must have been

27 For descriptions, analyses, illustrations, and bibliographies see: Mango, *Architettura Bizantina (Byzantine Architecture)* (as footnote 1), pp. 58f, 73-79; Mathews, *The Byzantine Churches of Istanbul* (as footnote 12), pp. 242-259, 262-312; Mainstone, *Hagia Sophia* (as footnote 8), pp. 148-150 and passim.

28 The close relationship has often been pointed out, and is emphasized recently in: Mainstone, *Hagia Sophia* (as footnote 8), pp. 154-157, 160, who also presents a summary of the evidence for dating Sts. Sergius and Bacchus; Mango, *Byzantine Architecture* (as footnote 1), p. 61, for further discussion and a somewhat different approach.

a viable option which they could have used[29]. It would have offered many of the same characteristics and advantages; above all, it would have been structurally safer and easier to realize, because the weight and thrust of the dome would have been primarily supported by eight rather than four piers[30]. The clear major spans of the supporting arches would have been greatly reduced. The structural risks reflected by the St. Sophia solution with four piers would have been reduced in equal measure, if a solution similar to that of Sts. Sergius and Bacchus had been chosen.

Why wasn't the central dome of St. Sophia designed with eight, rather than four major supporting piers? Several answers come to mind. One is that the architects and their patron may have been intent upon providing an entirely new solution (assuming that Sts. Sergius and Bacchus had already been built). The structural daring of the four pier solution may have intrigued them, in spite of the risks it certainly entailed. But the most probable answer, to my mind, tells us a great deal about the design premises which seem to have led to the solution we know. The most likely answer to our question appears to be that one primary goal of the design was to retain the basic basilica scheme of the earlier church, whether for religious, liturgical, symbolic or traditionalist, nostalgic reasons. As in the capitals, a conservative trend which respected and used earlier forms is evident. At least during the period under consideration,

29 As pointed out in: Mainstone, *Hagia Sophia* (as footnote 8), pp. 160f, the general features of the St. Sophia eastern and western hemicycles were to be found in a number of well known earlier tetraconch churches such as San Lorenzo in Milan and the cathedral of Bosra. However, only in Sts. Sergius and Bacchus is the location and sequence of arched and exedral bays the same as in St. Sophia; the primary differences are the scale, proportions, and the relationship between the dome and other parts of the building.

30 I am aware of the over-simplification in this statement, for in the east and west the weight and thrust of the major dome are also supported by the major exedras, which are, in turn, supported by the minor exedras and eastern and western minor piers. Though over-simplified, the comparison between the structural system of Sts. Sergius and Bacchus and that of St. Sophia is generally correct. See footnote 26 for the structure of St. Sophia, and particularly: Mainstone, *Hagia Sophia* (as footnote 8), pp. 161ff, for a more extensive discussion; Rowland J. Mainstone, 'Questioning Hagia Sophia', in: *Hagia Sophia from the Age of Justinian to the Present* (as footnote 26), Mark, Çakmak (ed.), pp. 158-176.

the decision to retain the basic components of an aisled basilica appears to have ruled out the construction of a dome over the nave on eight supports.

A second goal of the design, equal in significance, must have been the construction of a dome with enormous dimensions. With a diameter of 100 Byzantine feet, the span is about 50 % greater than that of other known masonry domes of the period supported by arches over a square or polygonal bay[31] (Fig. 21). Neither practical experience nor useful theoretical calculations would have been available to the architects in their achievement of this goal[32]. It seems unlikely, therefore, that they proposed this goal themselves, for the risk of failure was considerable. Nor does it seem likely that the clergy would have had a strong interest in the dimensions of the dome, whether or not it was included as a symbolic reference. The goal of enormous dimensions must have been Justinian's. By combining and realizing these two goals, the construction of an enormous dome, and the use of the basic features of an aisled basilica, Isidore and Anthemius succeeded in producing one of the high points in the history not only of architecture, but above all, of structural engineering. St. Sophia may be seen as the culmination in the fascination with structural innovation which characterized Roman, as opposed to Greek architecture in Antiquity, even though the immediate structural expertise appears to have originated in Asia Minor, rather than in other parts of the Empire[33].

31 Hans Buchwald, 'The Church of St. John the Theologian in Alaşehir (Philadelphia)', in: *Jahrbuch der Österreichischen Byzantinistik*, 30, 1981, p. 315, for a brief comparison of dimensions of this type of dome in the Early Byzantine period; Harrison, *Excavations at Saraçhane* (as footnote 13), pp. 406-411, Fig. A, B, reconstructs the church of St. Polyeuctus with a dome with a diameter of about 17-18 meters.

32 Mainstone, *Hagia Sophia* (as footnote 8), p. 168 and fn. 8, for references concerning structural theory before the 19th century.

33 It cannot be entirely coincidental that both Isidore and Anthemius came from Asia Minor. Mainstone, *Hagia Sophia* (as footnote 8), p. 157, sums up what is known about them; Mainstone, *Hagia Sophia* (as footnote 8), pp. 168-170, for structural precedents; for the antecedents of important structural features of St. Sophia in Asia Minor: Furio Fasolo, *L'architettura romana in Efeso*, Rome, 1962; Furio Fasolo, 'La basilica del Consilio di Efeso', in: *Palladio*, n.s. 5-6, 1957, pp. 1ff; Deichmann, *Studien zur Architektur Konstantinopels* (as footnote 3), pp. 19-40; Buchwald, *The Church of St. John the Theologian* (as footnote 31), p. 318.

A comparison of St. Sophia with the equally awe inspiring structural solutions of 13th century French cathedrals presents itself, not so much in terms of structural theory, as in terms of the approach used to achieve each solution (Fig. 22). The dizzying heights and slender proportions of the French examples were achieved step by step, the builders and patrons of each new church attempting to outdo, to some degree, dimensions and proportions of the last. In striking contrast, in St. Sophia the structural innovation was achieved in a single effort without, as far as we know, immediate transitional antecedents. The comparison brings to focus not only the structural skill and daring of Isidore and Anthemius, but also the fact that St. Sophia, perhaps more than any other known important building reflects «*architectural design upon Imperial command*». The differences in approach may, of course, be readily explained, above all, by the obvious social and political differences between 6th century Imperial Byzantium and the prospering cities of 12th and 13th century northern France.

The scale of St. Sophia appears to have had a profoundly «negative» impact upon later Byzantine church architecture. It must have been apparent to all, including Byzantine emperors, that St. Sophia could not be outdone in size. Constructing large churches was not an objective of later Byzantine church builders, including emperors. The thrust of creative endeavor, and of any showmanship which may have been involved in the design of later churches enjoying Imperial patronage was directed not to size, but to extreme splendour and design perfection. While there are many reasons for the small scale of medieval Byzantine churches one is surely that the size of St. Sophia could not be surpassed (Fig. 21 j).

3. The Dome over the Center of the Nave

It was the genius of the architects of St. Sophia which amalgamated its basic components, the aisled basilica, the dome supported by four arches on a square plan, flanking semi-domes, and polylobed annular solutions, into a single unified, unique building. These compo-

nents were organized in a manner which, on the one hand, provided a rhythmic interplay of spaces which emphasized the dominance of the central dome, while on the other hand, the composition appeared to be controlled by structural logic. The dome in the center of the nave, rather than near the chancel bay as in earlier solutions, was more effective not only visually, as a strong unifying feature, but also structurally, because it permitted the equal thrusts on the east and west to be supported equally. The exedras on the east and west, in turn, visually and spacially emphasized the central dome, while at the same time helping to support it (Fig. 23).

With this solution the architects of St. Sophia appear to have given a new direction to Byzantine church design. Even though basilicas with domes over the nave, near the choir, were probably constructed earlier, and basilicas without domes continued to be common in the decades after the construction of St. Sophia, eventually churches with domes over the centers of their naves, including those constructed on the inscribed cross scheme, dominated Byzantine church architecture[34]. In this, they seem to have been following the impetus of St. Sophia[35].

When considering church design dominated by a dome over the center of the nave it is relatively unimportant, whether or not St. Sophia was the first church with that feature. If another, less important, less renowned, less awesome church with similar features had been constructed somewhere in the Empire, it may not have had a permanent impact upon Byzantine church development. It must have been these well known qualities of St. Sophia which made a strong and lasting impact upon subsequent solutions inevitable. To be sure, the awe inspired by the church was not, in itself, sufficient to assure

34 For a general review of basilicas with and without domes in the 5th - 6th century period: Richard Krautheimer, *Early Christian and Byzantine Architecture*, revised edition, Harmondsworth, 1972, pp. 97-348; Mango, *Byzantine Architecture* (as footnote 1), pp. 35-107; Günther Stanzl, *Längsbau und Zentralbau als Grundthemen der frühchristlichen Architektur* (Österreichische Akademie der Wissenschaften, Philosophisch-historische Klasse, Denkschriften 139), Wien, 1979; Hans Buchwald, 'Western Asia Minor as a Generator of Architectural Forms in the Byzantine Period, Provincial Backwash or Dynamic Center of Production?', in: *Jahrbuch der Österreichischen Byzantinistik*, 34, 1984, pp. 215-223.

35 Mainstone, *Hagia Sophia* (as footnote 8), pp. 237-240, provides a generally similar view of the impact of St. Sophia on later Byzantine church construction.

that its *Leitmotif*, the basilica dominated by a dome over the center of its nave would become the central motif of later Byzantine church architecture: we must assume that the functional and spiritual requirements of later Byzantine architects and patrons echoed those evident in St. Sophia.

However, St. Sophia may well have been the first basilica with a dome over the center of its nave. No other known church with those features can convincingly be dated earlier. The reconstruction of St. Polyeuktos in Constantinople (524-527) is hypothetical and numerous other solutions present themselves; at any rate, the proposed reconstruction suggests a location for the dome immediately before the chancel, rather than in the center of the nave[36] (Fig. 21 b). The same is true of the dome of Church 2 in Ayatekla (Meriamlik), which is an undated building perhaps constructed in the latter part of the 5th century[37] (Fig. 21 i), and of the central tower of the East Church at Alahan Kilise, which has been attributed to the same general period[38]. A wood roof has been suggested for both of the latter churches, more convincingly for Alahan Kilise.

The earliest securely dated extant domed basilica is Justinian's reconstruction of St. Irene in Constantinople, which is contemporary with St. Sophia; here, too the dome is constructed near the

36 Harrison, *Ecavations at Saraçhane in Istanbul* (as footnote 13), pp. 406-411, Fig. B, for the reconstruction, including arguments for and against a domed solution which are, to my mind, equally valid. The reconstruction with a dome is not compelling.

37 Ernst Herzfeld, Samuel Guyer, 'Meriamlik und Korykos', in: *Monumenta Asiae Minoris Antiqua*, 2, Manchester, 1930, pp. 46ff, for a reconstruction with a masonry dome and an attribution to the latter part of the 5th century on stylistic grounds; George E. Forsyth, 'Architectural Notes on a Trip through Cilicia', in: *Dumbarton Oaks Papers*, 11, 1957, pp. 223ff, for a reconstruction with a wood roof and an attribution to the second half of the 5th century; Michael Gough, 'The Emperor Zeno and Some Cilician Churches', in: *Anatolian Studies*, 22, 1972, pp. 202ff, supports a reconstruction without a vaulted dome, and suggests a date in the reign of Emperor Zeno before 491. Neither the proposed reconstructions nor the evidence for dating are entirely convincing.

38 Arthur C. Headlam, 'Ecclesiastical Sites in Isauria', in: *Supplementary Papers of the Society for the Promotion of Hellenic Studies*, I, No. 2, London, 1892, pp. 9-19, is still valuable for illustrations; Forsyth, 'Architectural Notes on a Trip through Cilicia' (as footnote 37), pp. 228ff, 233ff; Mary Gough (ed.), *Alahan, an Early Christian Monastery in Southern Turkey*, Toronto: Pontifical Institute of Medieval Studies, 1985, with further references.

chancel[39] (Fig. 21 e), as it is in other examples, like the excavated Basilica on the Ilissos, attributed to the early 5th century[40], and Church B in Philippi, which is attributed to the period immediately after St. Sophia[41].

In contrast to all of these churches, basilicas dominated by a dome over the center of the nave are similar to St. Sophia, though they are much smaller and simplified, above all, by the lack of eastern and western exedras and piers. Like St. Sophia, they have a pronounced nave flanked by colonnades, clerestory windows, side aisles, a central dome, and relatively narrow major lateral arches. They are rare. The earliest datable example is Kasr Ibn Wardan, built 564, probably with Constantinopolitan expertise[42] (Fig. 24). The baptistery of the Hekatontapyliani on Paros[43] and an early domed phase of St. Nicholas in Demre (Myra)[44] are similar; the former has reasonably been dated to the latter part of the 6th century[45], and the latter should probably be dated to the same general period[46].

39 Urs Peschlow, *Die Irenenkirche in Istanbul* (Istanbuler Mitteilungen, 18, Beiheft), Tübingen, 1977, with references to earlier investigations.

40 Manoulis Chatzidakis, 'Remarques sur la basilique de l'Ilissos', in: *Cahiers Archéologiques*, 5, 1951, pp. 61ff, for the date, reconstruction, and references to earlier investigations.

41 Lemerle, *Philippes et la Macédoine Orientale* (as footnote 14).

42 Howard C. Butler, *Ancient Architecture in Syria*, Div. II, Section B-1, Leyden, 1907, pp. 26ff; Krautheimer, *Early Christian and Byzantine Architecture* (as footnote 34), pp. 261-263, comments upon the similarities to St. Sophia.

43 H. H. Jewell, F. W. Hasluck, *The Church of Our Lady of the Hundred Gates in Paros (Panagia Hekatontapyliani)*, London, 1920.

44 Urs Peschlow, 'Die Architektur der Nikolauskirche in Myra', in: *Myra*, Jürgen Borchardt (ed.), Berlin, 1975, pp. 303-359, with references to previous investigations.

45 Jewell, Hasluck, *The Church of Our Lady of the Hundred Gates in Paros* (as footnote 43), pp. 60-62.

46 Peschlow, 'Die Architektur der Nikolauskirche in Myra' (as footnote 44), pp. 342-345, suggests an 8th century date, based upon an analysis of vaulting and architectural features, and compares it to Kasr Ibn Wardan, St. Sophia in Salonica, the Koimesis in Iznik, and St. Clement in Ankara. However, only Kasr Ibn Wardan is securely dated; the Salonican church has recently been attributed to the late 6th - early 7th century, although it was previously attributed 780-787 (see footnote 49); the Koimesis may have been constructed in the late 7th century or the early 8th, and was certainly built before 727; St. Clement may also be attributed to the 7th century; the evidence for dating these churches is summarized in Hans Buchwald, *The Church of the Archangels in Sige near Mudania*, Vienna, Cologne, Graz, 1969, pp. 37ff, 44. I therefore suggest a late 6th or 7th century date for this phase of the church.

Like the previous group of churches, cross domed basilicas are similar to St. Sophia, but they have wider major lateral arches which give their domes improved lateral stability. In contrast to St. Sophia, the lateral arches and supporting piers are entirely inside the building, creating a more complex and less unified nave. The large piers required to carry their wider lateral arches created ungainly interior wall surfaces, which were difficult to articulate and to integrate with other features of the building[47]. Examples include the domed phase of St. Mary in Ephesus[48] (Fig. 21 b), St. Sophia in Salonica[49], the Church of the Dormition in Iznik (Nicaea)[50] and St. Clement in Ankara[51].

Churches built on the inscribed cross scheme must also have been inspired directly or indirectly by St. Sophia. Their domes, however, are on high drums, providing a vertical emphasis, their major lateral arches are even wider than in cross domed basilicas, and are clearly the arms of a cross, and the piers supporting the major

47 Buchwald, *The Church of the Archangels* (as footnote 46), pp. 37-62, for a discussion of this church type and its advantages and shortcomings, with additional examples and variations; for more general surveys and different evaluations: Mango, *Byzantine Architecture* (as footnote 1), pp. 89-96; Krautheimer, *Early Christian and Byzantine Architecture* (as footnote 34), pp. 297-315.

48 *Forschungen in Ephesos*, 4/1, Wien, 1932, pp. 1-78; Edmund Weigand, 'Review', in: *Gnomon*, 2, 1935, for a justified criticism of the proposed reconstruction; Fasolo, 'La Basilica del Consilio in Efeso' (as footnote 33), for an analysis of the structural system and criteria for chronology. The building has been variously dated from the 6th century to the 8th without conclusive evidence.

49 Kalliopi Theoharidou, *The Architecture of Hagia Sophia, Thessaloniki* (BAR International Series, 399), Oxford, 1988, with references to earlier publications and a late 6th - early 7th century date based upon circumstantial evidence. In: Buchwald, *The Church of the Archangels* (as footnote 46), pp. 43f, I proposed a date between 780-787, based upon an extant inscription and monograms of Constantine VI and Irene.

50 Theodor Schmit, *Die Koimesis-Kirche von Nikaea*, Berlin-Leipzig, 1927; Hans Buchwald, *the Church of the Archangels* (as footnote 46), pp. 44 and passim, for a summary of chronological evidence, which indicates a construction before 727, perhaps in the late 7th century or the early 8th; also: Urs Peschlow, 'Neue Beobachtungen zur Architektur und Ausstattung der Koimesiskirche in Iznik', in: *Istanbuler Mitteilungen*, 22, 1972, pp. 145ff. For a somewhat different date see Mango, *Byzantine Architecture* (as footnote 1), p. 90.

51 P. G. du Jerphanion, 'L'église de Saint-Clément à Angora', *Mélanges de l'Université S. Joseph*, 13, 1928, pp. 113-143; Buchwald, *The Church of the Archangels* (as footnote 46), pp. 37-62, for a discussion of numerous features and an attribution to the 7th century.

arches have been elegantly organized and reduced, usually to four columns or piers[52] (Figs. 2, 4, 21 j). Nevertheless, Byzantine clergy, architects and worshippers must have valued the strong relationship immediately evident between these buildings and the *Great Church*. After all, they were not art historians looking for telltale indicators of style and chronolgy; they must have been impressed by strong and obvious features, such as the nave dominated by a central dome.

4. Conclusions

Using the above observations the primary skills, approaches and goals reflected in the design of St. Sophia may be summarized as follows:

A. *Extraordinary engineering skills*, as reflected in the dome and the entire support system. Later additions, reconstructions, and substitutions affirm, rather than diminish the quality of the engineering, which included the flexibility which made these changes possible while retaining the original structural solution.

B. *Underlying conservatism*, as reflected in the use of the traditional aisled basilica as a basic component of the architectural solution. It is also reflected in such details as the Ionic volutes and acanthus surface decoration of the capitals.

52 Buchwald, 'The Geometry of Middle Byzantine Churches' (as footnote 2), for a description of this building type and its qualities; also: Krautheimer, *Early Christian and Byzantine Architecture* (as footnote 34), pp. 359-436; Hans Buchwald, 'Criteria for the Evaluation of Transitional Byzantine Architecture', in: *Andrias. Herbert Hunger zum 80. Geburtstag*, Wolfram Hörandner, Johannes Koder, Otto Kresten (ed.), (Jahrbuch der Österreichischen Byzantinistik, 44), 1994, pp. 21-31, for a recent brief review of the possible development of inscribed cross churches; Dorothea Lange, 'Theorien zur Entstehung der byzantinischen Kreuzkuppelkirche', in: *Architectura*, 16, 1986, pp. 93-113, for an extensive review of the same subject, including numerous other accounts and references; Mango, *Byzantine Architecture* (as footnote 1), pp. 96-98, 108-118, for a different approach to the inscribed cross church type.

C. *Radical innovation*, as reflected in the combination of an aisled basilica, the dome as the central feature of the nave and the complex exedral eastern and western nave terminations. The structural system also reflects radical innovation, even though there are antecedents for some aspects of the solution.

D. *An overriding sense of unity*, as reflected in the stereometric geometry evident in all interior components of the building, including the vaults, vertical surfaces, piers, column shafts, capitals and the details of their Ionic volutes. It is also reflected in the clear definition of the central space, in the limited variation of basic components such as capitals, and in the uniform, undercut decoration of many surfaces.

E. *Inherent contradictions*, as reflected in the dichotomy between underlying conservatism and radical innovation, or the desire, on the one hand, to combine previously unrelated architectural features, while on the other hand, creating a strong sense of unity. The greatest contraditction, however, is between the engineering system required to support the enormous dome and the appearance of weightlessness and lack of structural effort. I believe that we must assume that the architects, in their obvious sophistication, were aware of these inherent contradictions, and we may speculate that they enjoyed contemplating them as we do.

In addition, St. Sophia appears to have been pivotal for the design of Byzantine churches in later centuries.

Sources of Illustrations

Rowland J. Mainstone: Fig. 1, 7, 8, 17, 18.
Photo author: Fig. 2, 6, 12, 13, 15.
Brandenburgisches Landesamt für Denkmalpflege: Fig. 3.
Mango, *Architettura Bizantina* (as footnote 1), Fig. 289; Fig. 143; Fig. 164; Fig. 168; Fig. 259: Fig. 4, 21c, e, g, j.
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Thomas F. Mathews, Courtesy of Dumbarton Oaks: Fig. 9, 10.
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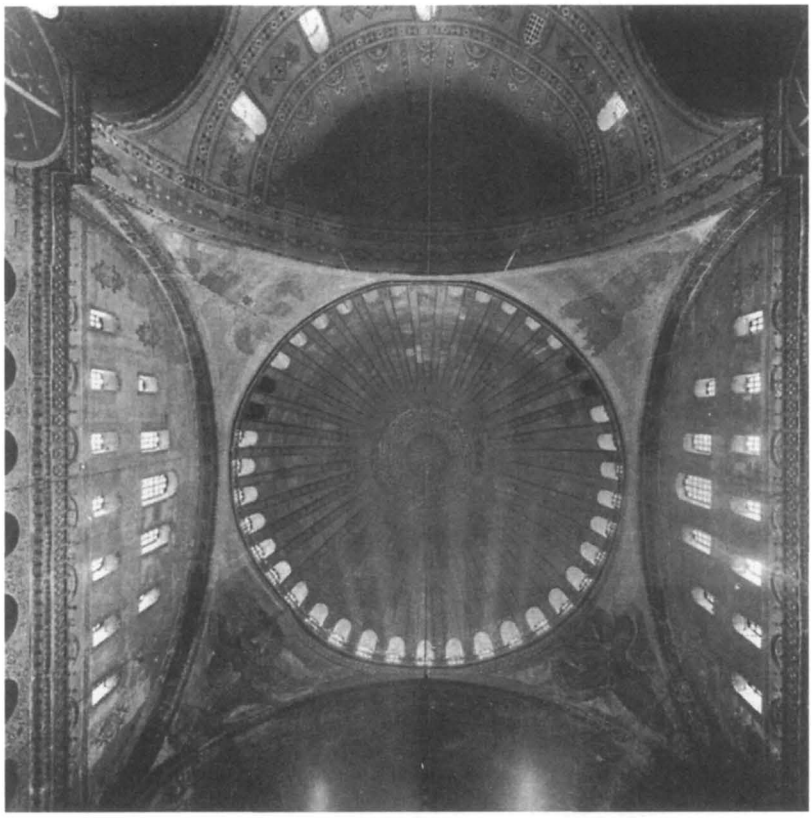
F. Knoll, *Forschungen in Ephesos, IV-1, Die Marienkirche*, Wien, 1932, Fig. 56: Fig. 21h.
Ernst Herzfeld, Samuel Guyer, *Meriamlik und Korykos*, Manchester, 1930, Fig. 46; Stanzl, *Längsbau und Zentralbau als Grundthemen der frühchristlichen Architektur* (as footnote 34), Tafel 31-1: Fig. 21i.
Heinz Kähler, *Die Hagia Sophia*, Berlin, 1967, p. 97, and Werner Schäfke, *Frankreichs gotische Kathedralen*, Köln, 1979, Fig. 69: Fig. 22.
Butler, *Ancient Architecture in Syria* (as footnote 42), Ill. 25 B; Stanzl, *Längsbau und Zentralbau als Grundthemen der frühchristlichen Architektur* (as footnote 34), Tafel 30-3: Fig. 24.

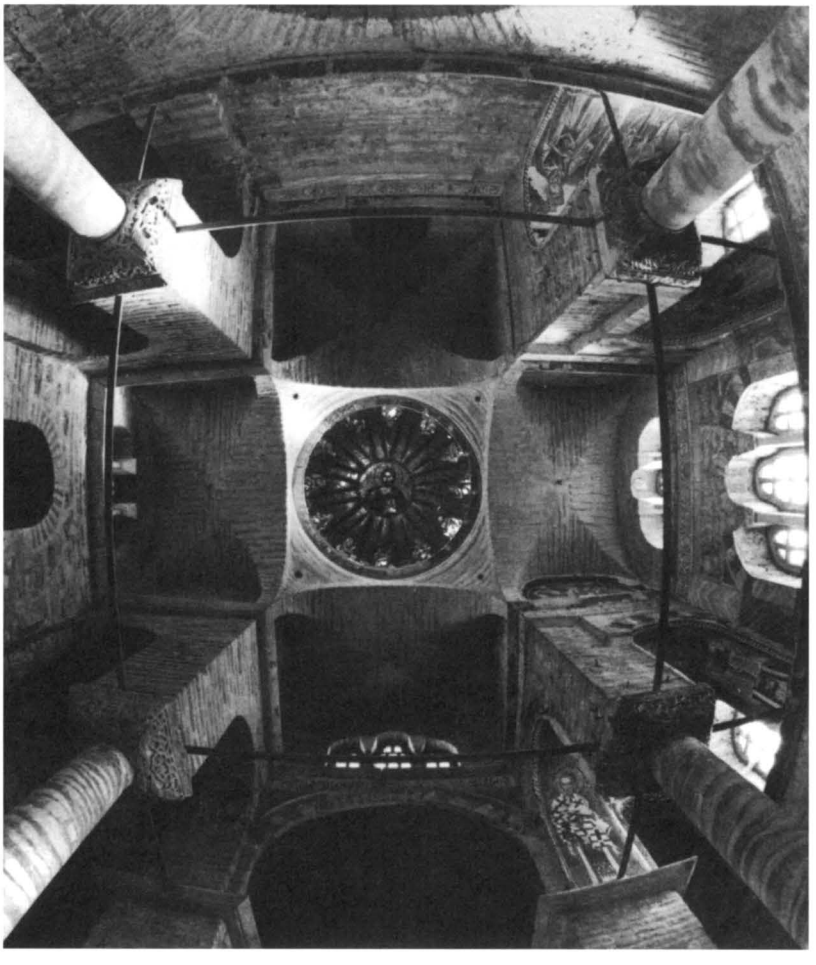
1. Istanbul, St. Sophia, from South.

2. Ligurio (Peloponnesus), Village Church, from South.

I



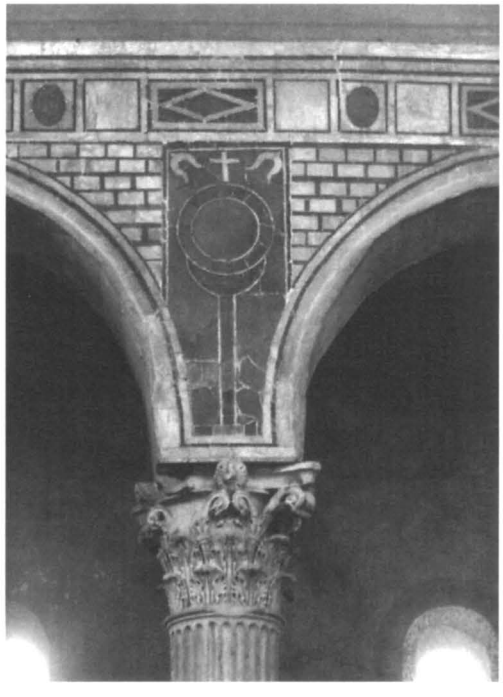
3. Istanbul, St. Sophia, Interior, 1906.



4. Istanbul, Church of the Virgin Pammakaristos (Fetiye Camii), Istanbul, Interior.

I

5.

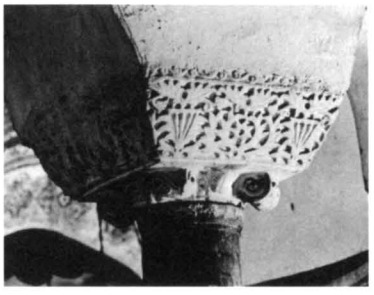


6.

7.

8.

5. Nîmes, Maison Carrée, Detail of Corinthian Order.
6. Rome, Sta. Sabina, Nave Capital.
7. Istanbul, St. Sophia, Nave Capital (Type A).
8. Istanbul, St. Sophia, Gallery Capital (Type B).



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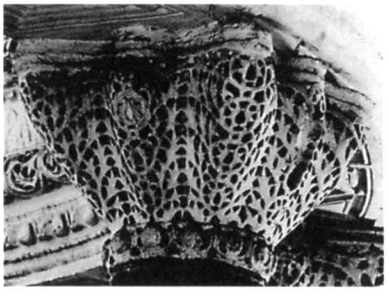

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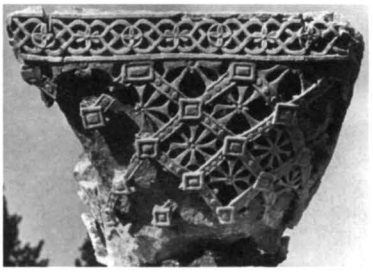

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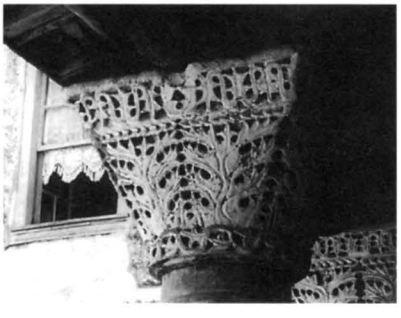


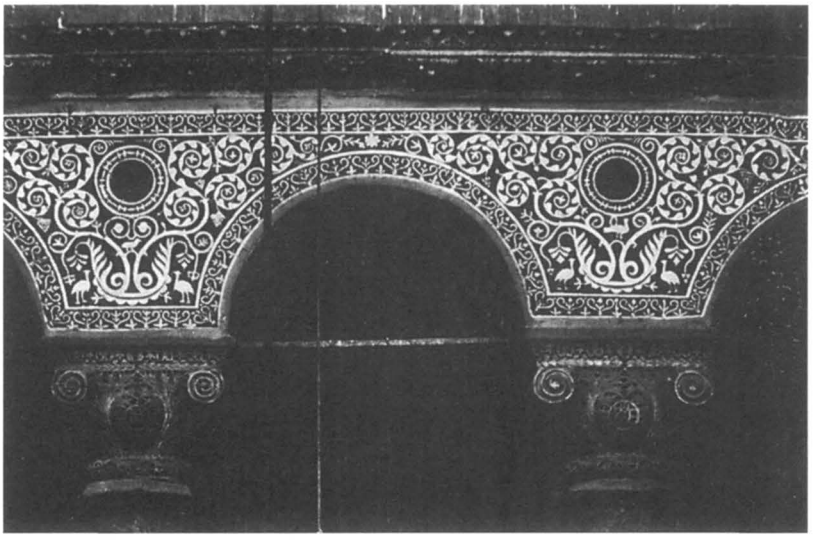
13.

14.

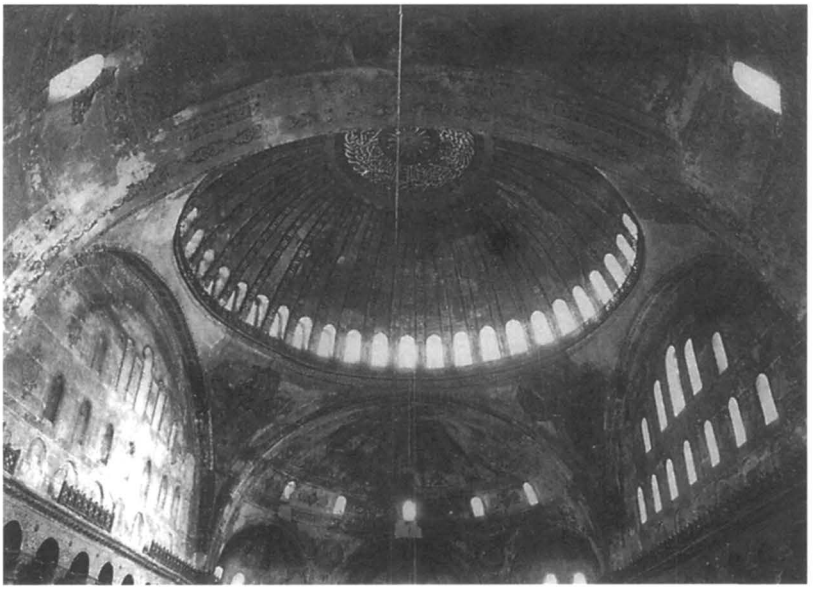
15.

16.

9. Istanbul, SS. Sergius and Bacchus, Nave Gallery Capital.
10. Istanbul, SS. Sergius and Bacchus, Nave Ground Floor Capital.
11. Istanbul, St. Polyeuktos Excavation, Capital.

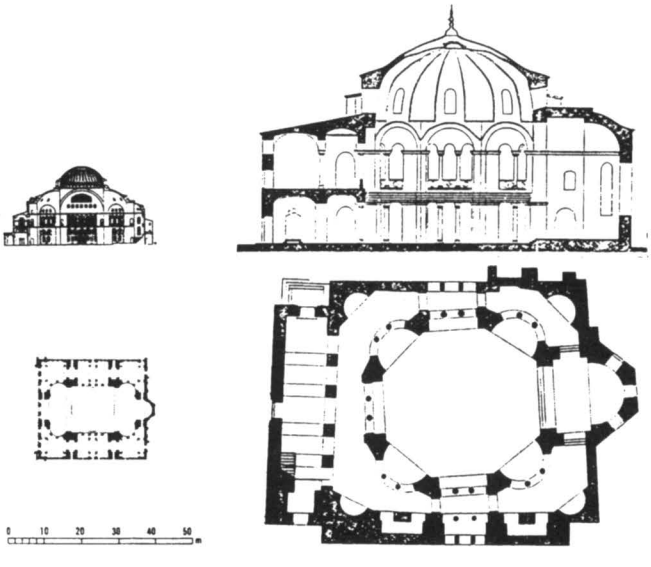


17. Istanbul, St. Sophia, Gallery Detail.

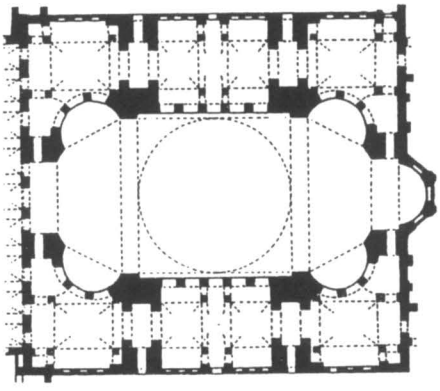


18. Istanbul, St. Sophia, Interior from West.

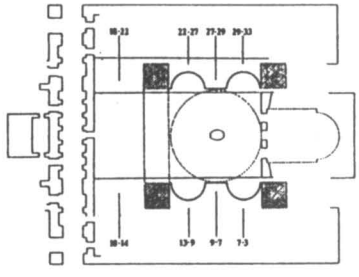
19. Istanbul, St. Sophia, Interior, 19th Century Drawing by Fossati.



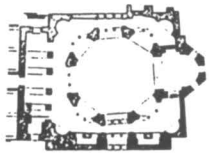
20. Plans and Sections of St. Sophia and SS. Sergius and Bacchus, Sizes Reversed.



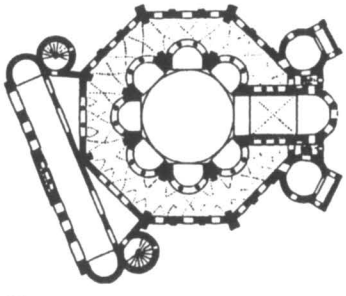
21a.



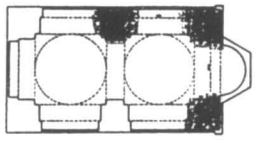
21b.



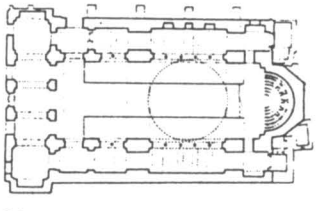
21d.



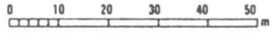
21c.



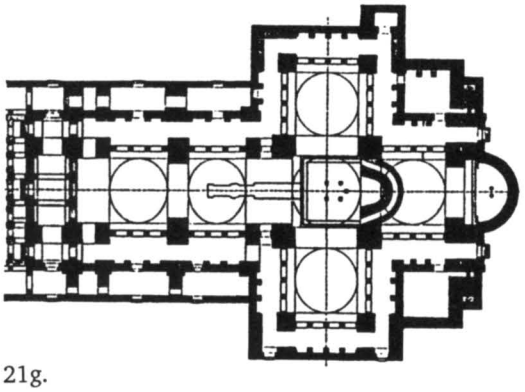
21f.



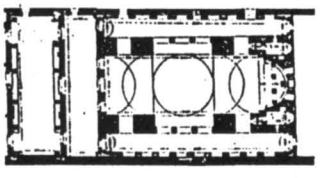
21e.



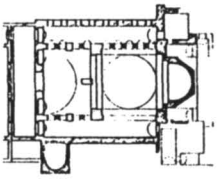
21. Comparison of dome sizes in churches which, except j, may be contemporary with or earlier than St. Sophia.
21a. Istanbul, St. Sophia.
21b. Istanbul, St. Polyeuktos.
21c. Ravenna, San Vitale.
21d. Istanbul, SS. Sergius and Bacchus.
21e. Istanbul, St. Irene.
21f. Alaşehir, St. John's.



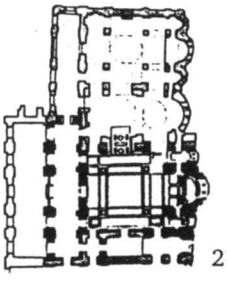
21g.



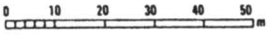
21h.



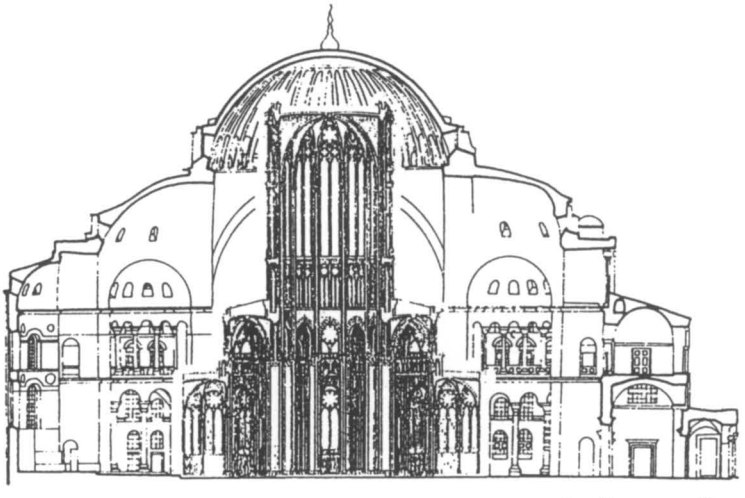
21i.



21j.



21g. Ephesus, St. John's.
21h. Ephesus, St. Mary's, domed phase.
21i. Ayatekla (Meriamlik), Church 2, Reconstruction.
21j. Istanbul, Pantocrator Monastery.



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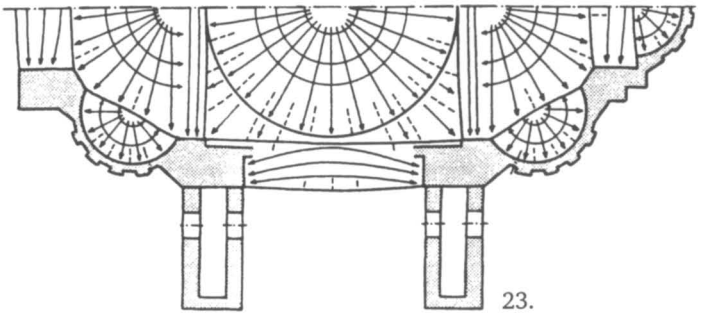
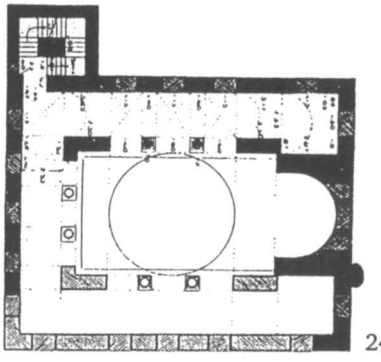


23.



24.

22. Istanbul, St. Sophia, and the Cathedral of Beauvais, superimposed sections.
23. Istanbul, St. Sophia, schematic plan of south half with arrows indicating distribution of thrusts.
24. Kasr Ibn Wardan, Church, reconstructed gallery plan.

II

THE CHURCH OF ST. JOHN THE THEOLOGIAN IN ALAŞEHIR (PHILADELPHIA)

With twelve plates*

Kleinasien, ein Neuland der Kunstgeschichte was the apt title of Strzygowski's important documentation of a number of churches in Asia Minor published in 1903. The ruins of the church of St. John the Theologian in Alaşehir demonstrate that Strzygowski's title would be no less appropriate today. The architectural forms and the scale of the building are surprising in the context of presently known buildings in Asia Minor, and place the church directly into the main stream of major Byzantine vaulted monuments.

The church of St. John was mentioned briefly by Lampakis in 1906[1], who published a sketch plan, a photograph, and a short description of the building and its surviving frescoes. His description and photograph indicate that, while the building has not deteriorated appreciably since the turn of the century, the frescoes have suffered severely. I have used the dedication for the church given by Lampakis, even though he does not document it, for lack of a better source. The church may never actually have been dedicated to St. John, but seems to have been known under that name already in the early 19th century, when it was mentioned by Arundell[2]. Arundell gives a very brief description of the church, which was already a ruin, and compares it with other churches built in the same manner in Sardis and Ephesus with uncanny accuracy.

I first visited the church of St. John in the summer of 1975 with Prof. Clive Foss, to whom I am greatly indebted for drawing my attention to the building. My drawings, notes, and photographs were made in that summer and in 1979, unfortunately without scaffolding or surveying equipment.

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* All photographs and drawings were made by the author 1975—1979, and all show the church of St. John the Theologian in Alaşehir.

[1] G. LAMPAKIS, Χριστιανικὰ μνημεῖα, ἐρείπια καὶ συντρίμματα. Ἑπτὰ ἀστέρες τῆς Ἀποκαλύψεως. Athens 1906, 375—377. I suggest maintaining Lampakis' title for the church, which seems to depend upon local 19th century tradition, even though St. John the Theologian is, of course, more commonly referred to as St. John the Evangelist.

[2] V. J. ARUNDELL, A Visit to the Seven Churches of Asia. London 1828, 169ff.

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Not only the size and excellent workmanship evident in the church, but also its location almost exactly in the center of the walled portion of the city imply that the church of St. John was the major church of Philadelphia, perhaps the cathedral of the city.

1. The Visible Remains

Only three piers of the church of St. John are now visible. However, the forms and dimensions of the piers provide valuable information concerning the original plan of the church. Moreover, fairly large portions of vaulting and of facade facing cling to the masonry core of the piers, providing an enticing, if only fragmentary, idea of the building's original appearance (Fig. 4).

The NE pier is best preserved. Its over all dimensions at ground level are about 6.70 × 6.70m. In plan it seems to have had straight sides on the N and E which met at a right angle at the NE corner. Its S and W sides had profiles in plan with reëntrant angles stepped toward the E and N which directly reflect the arches the pier carried. On the S and W sides the pier is faced with well preserved, large, well cut ashlar blocks, probably reused spoils, laid in regular horizontal courses with thin mortar joints to a height about 6.80m above present grade (Fig. 6—9). Much of the N side of the pier is also faced with ashlar of the same description. While most of the lower courses have been removed, several upper courses and the NW corner of the pier are sufficiently well preserved to trace the original appearance and location of the ashlar here. In a horizontal strip approximately equivalent to the two upper ashlar courses of the W and S sides, about .70—.80m high, the rubble core extends to the present N face of the pier, suggesting that this portion of the pier was covered by a veneer. Only remnants of the original ashlar facing remain on the pier's E side. The rubble core extends to the E face of the pier in an area analogous to the rubble core which extends to the N side of the pier, and here, too, there must originally have been a veneer (Fig. 9, 14, 15).

A small passageway about .80m wide and perhaps 2.00m high, its top near the top of the pier, extended into the pier from the E. Its walls were clearly plastered and its floor seems to have been made of tile. It must have stopped inside the pier, for no equivalent passageway can be traced on the other sides of the pier, even though they are relatively well preserved. The passageway was blocked by masonry with a clean face flush with the E face of the pier which was constructed of small, roughly cut ashlar blocks or field stone and brick laid in horizontal courses.

A stone string course marks the top of the S and W sides of the pier, about 6.80m above present grade. It is composed of members cut with two different and distinctive profiles, types A and B. Type A has a cyma recta profile with a pronounced, thin astragal at the top, two pronounced, thin astragals at the bottom, and a well worked, smooth surface throughout. Below the lower astragal there is a dentil frieze worked with equal precision on some of the pieces (Fig. 6—9, 18—20). Type A is used primarily on the S side of the pier, and is represented on the W side only by a single member. Type B has a flat raking profile which slopes diagonally down and inward to meet a short vertical face or a quarter round torus. In type B the surfaces are not as smoothly finished as in type A, and the stone seems to have a more granular structure. A number of members cut with profile type B seem to have been cut for their specific locations, because their raking surfaces follow the complex stepped plan of the SW corner of the pier. Type A, on the other hand, seems to be composed only of reused members which do not follow the stepped plan of the pier.

The string course ends flush with the N and E faces of the pier, and cannot have continued on the pier's N and E sides. No trace of a string course is extant in these walls, even though they are relatively well preserved at that height, at least in some areas. The stone members of the string course on the S and W sides of the pier reach back into the wall at least .40 to .60m, and if an equivalent string course had existed on the N and E sides of the pier, its remains either in the form of a reworked ashlar course or as a deep cavity should still be visible at the height of the string course on the S and W sides.

The vaults which sprang from the S and W sides of the pier are sufficiently well preserved to clearly identify their specific forms. With the aid of comparable features which are preserved on the SE and NW piers the original dimensions of the vaults may also be reconstructed. Broad arches extended to the S and W of the pier, and these arches, in turn, carried either a pendentive dome or a dome on pendentives (Fig. 6, 7, 9, 18). Each of the arches was divided into a broader part with a somewhat larger span on the side adjacent to the pendentive, and a somewhat narrower part with a smaller span on the side away from the pendentive. The broader part of the arch on the S side of the pier was about 3.30m wide and had a clear span of about 12.20m. Its E and W edges were almost flush with the edges of that part of the pier which carried it. The narrower part of the same arch was about 2.48m wide, and its clear span was about 11.28m. While its W edge was almost flush with the W face of that part of the pier which carried it, its E edge, which had a clean face on the E, extended about .65m to the E of the E face of the pier (Fig. 7). The broader portion of the arch on the

W side of the pier was about 3.24m wide and had a clear span of about 12.18m. While its S edge was almost flush with the S face of that part of the pier which carried it, its N edge was about .10m S of the edge of the pier below. The narrower portion of this same arch seems to have been about 1.87m wide, and had a clear span of about 11.32m. The N edge of this part of the arch is poorly preserved, but it seems to have been flush with the N face of the pier. Small holes near the N edge of the intrados of the arch may have served to hold clamps or dowels, perhaps used to fasten clerestory walls or windows, although other evidence contradicts such an explanation[3].

Because of the very close correspondence between the dimensions of the arches spanning S and W from the NE pier the dome which was supported by these arches may reasonably be assumed to have been almost exactly round, rather than oval, in plan. Unfortunately, only small portions of the pendentives are extant (Fig. 6, 18).

All of the extant vaulting is constructed of large, thin bricks with narrow mortar joints usually laid in neat common bond, backed by mortared rubble. The bricks seem to have been produced for the church, for they are extremely regular in size and broken bricks do not seem to occur in well preserved surfaces. Only the lowest course of the arches is constructed of ashlar. While brick sizes could not be measured without scaffolding, the ratio of the brick heights to the heights of the horizontal mortar joints is about 1:1.

Extensive portions of the original brick facade facing are extant on the N and E sides of the pier above the ashlar facing, approximately at the height of the extant vaulting of the S and W sides of the pier. The character of the brickwork in the facade facing is the same as that of the extant vaulting, and there is no reason to believe that any portion of the extant brickwork, either in the facades or in the vaults is not contemporary. Both the E and N sides of the pier facades are articulated by large blind arcades which are recessed twice, and which have approximately the same dimensions (Fig. 14, 15). The arcade on the pier's E side is almost as wide as the pier, and the face of its inner arch is almost flush with the face of the extrados of the major arch which spanned S from the pier (Fig. 15). The face of the E facade lies about .65—.80m E of the E face of the ashlar below it, the bricks being cantilevered out beyond the rubble core. The outer arcade of this portion of the facade is poorly preserved, but apparently it did not reach down to the bottom of the inner arcade on its S side, because it is interrupted here by the extrados of the major arch.

[3] See p. 313 below.

The blind arcade on the pier's N side is better preserved (Fig. 14). In contrast to the arcade on the E side of the pier, its inner face seems to be almost flush with the ashlar masonry of the pier below it. A small portion of the spandrel above the E side of the arcade is extant, its face flush with the outer face of the outer arch. The exact form of the spandrel W of the arcade, however, is unclear because of weeds which now hide this part of the masonry; while there seems to be a brick face here approximately flush with the N face of the ashlar facing, this face need not necessarily have been the original facade facing, which was flush with the N face of the outer arch in an extant section of masonry W of the arcade below the spandrel. A small engaged brick pillar about 1.25 m wide is located E of the arcade. Its N face projects about .30 m N of the outer, N face of the blind arcade, and this face was, in turn, articulated by a blind niche which was recessed only once and which may have had a horizontal, rather than an arched upper edge. A number of horizontal brick courses are extant at the top of the outer, N face of this pillar, and no trace of an arch is extant in the same area (Fig. 14). The E face of this small pillar, which is well preserved in some places, is almost flush with the outer face of the outer arch of the blind arcade on the E side of the pier, and the NE corner of the small engaged pillar therefore forms the NE corner of the extant facade articulation.

Nowhere, on the E and N sides of the pier is there evidence of vaulting, and both surfaces are sufficiently well preserved to be certain that vaults did not spring from the visible portions of these two sides of the pier. Neither is there evidence that a wooden roof was attached to either the E or N side of the pier. If a roof had been attached here, for instance near the bottom of the extant brick facade facing, either corbels to support beams or numerous cavities caused by beams placed with their ends inside the wall should be evident. The cavities which are evident, however, are no more numerous here than elsewhere in the brick facade, and were probably created by wooden tie beams which seem to have been used throughout the rubble core of the pier or by the scaffolding. Similar cavities are also found at about the same level near the bottom of the vaults on the S and W sides of the pier (Fig. 6, 8)[4].

The NW pier is almost as well preserved as its NE counterpart and provides equally valuable information (Fig. 5, 10—12). Its N side is straight in plan and is approximately flush with the N side of the NE pier. Its E side has profiles with reëntrant angles in plan which correspond almost exactly to those of the W side of the NE pier, and these profiles are repeated on the W side of the NW pier, making the pier symmetrical in

[4] See also p. 308 below.

plan about its N—S axis. The over all dimensions of the pier at present grade are about 6.45 (E—W) × 6.35 m, only slightly less than the dimensions of the NE pier. Although the S end of the pier was inaccessible when I visited the church, all major features of the pier can be reconstructed with reasonable certainty.

The lower portions of the NW pier are built of ashlar facing comparable with that used in the NE pier. Bricks placed vertically into the vertical ashlar joints are used occasionally in the NW pier. Although much of the ashlar facing is lost on the N side of the pier, enough remains to indicate that the ashlar continued to the height of the spring line of the vaulting without being interrupted by a strip of mortared rubble comparable to that found at the same height on the N side of the NE pier. An open vertical joint exists in the ashlar facing on the W side of the pier, in the reëntrant angle between the N and central pier sections (Fig. 11). However, because the character of the masonry is the same on both sides of the joint, and because of the strict symmetry and regularity of the plan of the pier this joint cannot represent a long interval in the construction of the building. Moreover, because similar vertical joints do not occur elsewhere in comparable locations the joint does not seem to represent an attempt to deal with different loading conditions in different parts of the pier. The most reasonable explanation of the joint seems therefore to be that it represents a brief interval in the construction of the church or an accident in the course of construction.

A cornice or string course was used on the E, S, and W sides of the NW pier at the same height as the cornice of the NE pier. While most of the members are roughly cut with raking profiles characteristic of profile type B, members which were more carefully cut with cyma profiles like those of type A were used occasionally (Fig. 11, 12, 22). The members cut with profile type B were not always cut to fit the complex plan of the pier, and some of these members may, therefore, also have been reused spoils[5]. On the W side of the pier there is also a section of the cornice with a simple, uncarved almost vertical face which may, perhaps, represent a later repair. The cornice ends abruptly at the N face of the pier on the pier's E and W sides and was not used on the N side.

The remnants of vaulting on the E, S, and W sides of the upper part of the NW pier correspond closely with those of the NE pier, and are built of

[5] Similar cornice profiles were used already in late Imperial buildings in Asia Minor, for instance in the baths N of the city walls of Hierapolis (P. VERZONE, Le chiese di Hierapolis in Asia Minore. *Cahiers Arch.* 8 [1956] 40ff., fig. 2—3), in the bouleuterion of Cibyra, and the theater of Selge (D. DE BERNARDI FERRERO, Teatri Classici in Asia Minore. Rome 1966, 27ff., 45ff., figs. 40, 41, 52, 54, 73).

brickwork of the same character (Fig. 10, 11, 16). The arch which sprang from the E side of the pier was the same arch which sprang from the W side of the NE pier[6]. The arch which sprang from the W side of the NW pier seems to have had the same dimensions, for the dimensions of those portions of the pier which carried these arches are almost exactly the same. The lowest part of a pendentive which appears to be equivalent in all respects to the pendentive of the NE pier is also extant in the SW corner of the vaulting of the NW pier, indicating that a second dome equivalent in size with the dome which was located S of the NE and NW piers existed to the SW of the NW pier (Fig. 22). The arch between these two domes sprang from the S side of the NW pier and measured about 3.44 × 12.20m.

The disintegration of some portions of the vaulting which clings to the NW pier makes observations concerning the construction of the vaults possible. For instance, there is clearly a face on the masonry of the SW pendentive against the S arch which carried it (Fig. 22). This face must have been constructed from the rear, inside the pier, for the S arch must have been built either before or at the same time as the pendentive. An open joint seems also to have existed between the pendentive and the W arch, suggesting that the arches were constructed first, and that the pendentive was expected to behave as a structurally independent feature. There is also an open joint in the W arch, at the upper edge of the extrados of the smaller, N portion of the arch (Fig. 22). While near the bottom of the arch the joint is so close to the intersection between the two portions of the arch that it can hardly be recognized, near the top of the extant masonry the joint is located within the extrados, a small outer portion of the extrados having been constructed together with the upper, S portion of the arch. The only reasonable explanation of this feature is that the lower, N portion of the arch was constructed first, and that discrepancies in the form of that arch, perhaps caused by settling, were corrected when the upper, S portion of the arch was constructed.

The upper part of the N side of the NW pier retains extensive portions of brick facade facing, including a large blind arcade which is recessed twice, which is comparable in most respects with the brick facade articulation of the N and E sides of the NE pier (Fig. 16). A small portion of the spandrel above the W side of the arcade has been preserved, its surface flush with the extrados of the outer arch of the blind arcade. The spandrel seems to end with a vertical face on the W near the W edge of the blind arcade, and then to continue to the W with its face recessed several

[6] See p. 303f. above.

centimeters, so that its N face is flush with the N face of the major lateral arch (Fig. 16, 23).

As in the NE pier, no trace of a vault or of the seat for a vault exists on the visible parts of the N side of the NW pier, nor do traces of a wooden roof attached to the pier exist there. A portion of the brickwork has fallen away near the bottom of the facade facing, exposing horizontal cavities both parallel with and perpendicular to the facade (Fig. 24). Similar cavities seem also to exist higher in the same masonry. They were probably created by timbers which have disintegrated, and which were used to strengthen the mortared rubble core of the piers[7]. There is also a system of cavities higher in the facade facing of the NW pier, which is particularly well preserved in some places, but these cavities, which are spaced very regularly and seem to have been placed with consideration for the facade articulation were probably left by timbers used to support the scaffolding during construction (Fig. 16).

The SE pier is less well preserved than the other two remaining piers and is also less accessible. Enough of the pier is, however, visible to provide basic information concerning its appearance. In plan it is an exact counterpart of the NE pier, symmetrically reflected about the E—W axis of the church. Its N and W sides have profiles with reëntrant angles in plan which correspond with those of the S and W sides of the NE pier, permitting the reconstruction of the vaulting solution described above (Fig. 4, 13)[8]. The S and E sides of the pier, on the other hand, are straight in plan and meet at a right angle at the SE corner of the pier in a location which corresponds with that of the NE corner of the NE pier.

The visible portions of the pier are faced with ashlar masonry comparable in appearance and height with that used in the other two piers (Fig. 13). The ashlar is well preserved on the N and W sides, very poorly preserved on the E side, and blocked from view at present on the S side of the pier. A cut stone cornice was used at the top of the ashlar facing on the N and W sides of the pier, but clearly not on the S and E sides. The extant members of the cornice appear to have been cut with profile type B, for the most part for the specific locations they occupy, and were probably created at the time the building was constructed. In places the raking profile seems to be partly round, but the roundness may be due to erosion of the relatively

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[7] H. BUCHWALD, Sardis Church E – a Preliminary Report. *JÖB* 26 (1977) 274ff., and IDEM, Lascarid Architecture. *JÖB* 28 (1979) 268, 285, for an account of similar techniques in 13th century buildings and possible reasons for their use.

[8] See p. 303f. above.

porous stone, for in some areas the profile of the cornice is almost entirely eroded away (Fig. 13).

Only the very lowest portions of the vaulting and the rubble core remain, not enough to determine the original forms of the vaults except by analogy with the extant portions of the vaults of the NE pier. Like the vaults of the two other piers, the lowest course consisted mostly of ashlar blocks. Small areas of the brick facade facing are extant above the ashlar on the S and E sides of the pier. Only enough remains on the E side to observe that there was a clean brick facade face which seems to have been equivalent to that on the E side of the NE pier. On the S side of the SE pier, however, remnants of a blind arcade which was recessed twice are still visible and are clearly comparable to the much better preserved facade remains on the N side of the NE pier (Fig. 17).

Plastered surfaces are extant in several areas, applied directly either to the brickwork of the vaulting or to the ashlar facing of the piers, while clamps for fastening revetment are not evident anywhere, even though some surfaces where revetment could be expected are relatively well preserved. Poorly preserved, and for the most part dirty and weathered patches of fresco can be identified in numerous places on the vaults and piers, a tantalizing remnant of the rich ensemble described by Lampakis[9]. Nowhere are the frescoes preserved well enough nor are they clean enough in their present state to determine stylistic features with any degree of certainty, and only occasionally are figures identifiable within a broader context. The largest fresco patches exist on the S and W faces of the NE pier, on the E face of the NW pier, on the N face of the SE pier, and on the intrados of the lower arch springing from the E side of the NW pier, suggesting that some of the surfaces in the vaulted part of the church were decorated by fresco. On the other hand, no fresco patches have been preserved on the N sides of the NW and NE piers, nor on the E sides of the NE and SE piers, suggesting that these surfaces did not contain frescoes.

Roundels occur at the top of the S side of the NE pier, just underneath the string course (Fig. 20). Two roundels occupy almost the entire breadth of the E section of the pier, which is about 1.83m wide, so that each roundel has a diameter of about .85m. Other roundels of about the same diameter can be traced near the top of the central portion of the pier, indicating that there was probably a frieze of similar roundels skirting the top of this side of the pier. A halo with a diameter about one half that of the roundel can

[9] LAMPAKIS 375ff. describes numerous fresco scenes now no longer recognizable, and mentions that three layers of fresco existed on one of the piers.

just barely be made out near the top of the E roundel, suggesting that busts of saints were represented inside the roundels. Wide deep red borders were used at the inner and outer edges of the pier.

A large half figure is represented near the upper S corner of the W side of the NE pier (Fig. 26). The head is depicted *en face*, with a white beard, deep wrinkles, beady eyes, and a decided frown; the right hand seems to approach the mouth just under the beard. A small figure with a golden halo was painted over the face of this figure, the halo being only about one quarter as large as the face of the earlier fresco beneath it. While this figure can hardly be distinguished, it seems to be part of a larger ensemble which is located somewhat lower on the same side of the pier (Fig. 26). Here two figures can be made out in a barren mountainscape, the total heights of the figures being about the same as that of the half figure above. The figure on the left has a halo and is positioned in $^3/_4$ view facing the figure on the right, its right hand stretched out as if to touch the other figure. This figure is also in $^3/_4$ view, facing left; its head is covered by a cloth and the face is bearded. The figure on the right stands in a mountain crag, with its feet and the lower part of its body hidden by the mountain. The entire mountain is shown to the right of the two figures, its right side curving down near the S edge of the pier. Remnants of robes can be seen above and to the right of the mountain, indicating that a figure was originally also represented here. The modelling of this scene, and particularly of the figure with a halo is extremely accomplished and very finely worked, the robes being painted with minute precision, occasionally with delicate, rectilinear robe folds, but without unduly complicated robe configurations. The coloring is subtle: the figure on the left has a white shirt, reddish brown robe, light brown hair, a very fair face, and a halo of golden yellow, while the figure on the right has a ruddy complexion, dark red robe, and brown beard. The mountain is almost white with light brown and grey shadows, and the background is very dark, perhaps a blackened blue. A dark red border is located on the S edge of the scene, at the S edge of the pier face.

Immediately below this scene is still another scene, which depicts numerous men standing close together. Only their heads are now extant, some shown *en face* and others in $^3/_4$ view (Fig. 21). The heads in the foreground are about twice as large as the heads of the two figures in the scene above, but not quite as large as the single half figure in the uppermost fresco, and it is unclear to which fresco layer this lower scene belongs. There is no border evident between this and the other scenes. Most of the heads in the foreground have beards and long white hair, and some are balding or nearly bald. Only the very tops of the heads in the background can be seen above and between the foreground heads, appar-

ently in an attempt to add perspective depth. While some of these heads have white hair, others are covered by pointed bright red hoods, probably belonging to monks' habits. Beneath the necks of the foreground heads there is a shallow horizontal zone of light wavy lines which may well represent water. A crucifixion on a dark blue ground was represented to the N of these three scenes, but it is so poorly preserved that individual features can hardly be recognized and it cannot be recognized in photographs. On the same side of this pier I noted fragments of figures wearing robes richly decorated with numerous crosses in 1975, but these figures had disappeared in 1979 and were not photographed.

The extant frescoes on the other two piers are less extensive and not as interesting. Perhaps most significant, both in reconstructing the original extent of the fresco decorations, and in reconstructing the original appearance of the church, is a halo which can clearly be recognized near the N edge of the intrados of the lower, or N section of the arch which sprang from the E side of the NW pier. The existence of this fresco fragment indicates that at least portions of the vaults were also covered by fresco ornamentation, and that the lunette wall seems to have been attached to the N face of the arch rather than to its intrados (Fig. 25).

In several areas on the E and W sides of the NW pier the extant plaster patches are decorated with incised horizontal and vertical lines approximately over the horizontal and vertical joints of the ashlar masonry. The incised lines are 10 to 15mm apart, and the area between them is painted white or red. Occasionally these lines are painted to suggest the appearance of cloisonné masonry, even though the ashlar facing has little in common with that masonry type. Blue patches of fresco on plaster which is clearly later than that with the incised lines indicate that scenes with figures may have been applied to these walls during a later period (Fig. 27).

Four small, poorly preserved fragments of carved architectural marble ornamentation existed on the site, but not *in situ*, in 1975. The most interesting is decorated by an egg and dart, with a bead and reel immediately below, and an acanthus frieze immediately above (Fig. 28). All the motifs are carefully cut with almost flat surfaces and deep undercutting. Two other fragments, one of which is so badly mutilated that the motifs can hardly be recognized, may belong to a single frieze, perhaps an entablature (Fig. 29, 30). A vine motif in the center, carved with a flat surface and deeply undercut, is flanked by an egg and dart and an acanthus frieze. The fourth fragment is the volute of a late Imperial composite capital (Fig. 31). None of these pieces need have been used in the church of St. John, and if they were they could have been reused spoils.

2. Reconstruction

The nave of the church of St. John the Theologian was covered by at least two domes on pendentives or by two pendentive domes disposed along the major E—W axis of the church[10]. While no direct evidence for a third dome on the major axis of the church exists at present, the possibility that one may originally have existed must be considered[11]. The eastern dome was round in plan and had a diameter of about 14.40m, and the western dome seems to have had the same form and dimensions. The arches which carried the domes and pendentives were between about 5.10 and 5.75m wide with the exception of the arch between the two domes, which had a width of only about 3.44m. The vaulting was constructed of neat brickwork, laid in common bond, backed by mortared rubble. The bricks were large and flat, with narrow mortar joints.

Six major piers carried the arches which supported the domes, assuming that the church had only two domes over the nave. Their total dimensions range between about 6.45 × 6.35m and 6.70 × 6.70m, or almost half the size of the diameters of the domes. In plan the piers had profiles with reëntrant angles which correspond closely with the shapes of the arches they carried. However, the sides of the piers facing the exterior of the church were straight in plan. The piers were constructed with a mortared rubble core faced on all sides with large well cut, probably reused ashlar blocks up to the level of the spring lines of the vaults, about 6.80m above the present grade.

Above that level those sides of the piers which faced the exterior of the church were faced with brickwork similar in character to that of the vaults, but clearly articulated as facade surfaces. Each face was decorated by a blind arcade which was recessed twice, which was about 6.60m high, and almost as wide as the pier. In addition, the E end of the N side of the NE pier was also articulated by an engaged pillar of brick, which was rectangular in plan and which was in turn articulated by a blind niche recessed only

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[10] It is unlikely that the dome had a true drum, because the church was probably built no later than the early 7th century (see p. 317 ff. below). H. Buchwald, The Church of the Archangels in Sige near Mudania. Vienna 1969, 55 ff. for a brief account of the development of the cupola and drum between the late 6th and 9th centuries.

[11] A number of churches with three domes over the nave are presented in G. A. Sotiriou, Les eglises byzantines de Chypre à trois et à cinq coupoles et leur place dans l'histoire de l'architecture byzantine. *SBN* 6 (1940) (V. Congresso internazionale di studi bizantini, Roma 1936, 2) 401 ff.

once which probably had a horizontal upper edge. Similar engaged pillars may also have been used in other comparable locations[12].

A continuous stone string course or cornice was used to crown the ashlar facing where it met the bottom of the vaulting. Two types of profiles occurred in the cornice, one with a cyma recta in the center, the other with a raking surface. While the former seems to be composed entirely of members which were reused, at least some of the members cut with the latter profile seem to have been created for the church. The cornice does not occur on those sides of the piers which face the exterior of the building, but stopped at the outer faces of the piers.

The inside of the church was covered with plaster which was, in turn, painted with frescoes. The extant frescoes indicate that both the vaults and vertical surfaces were treated in this medium. Neither plaster nor frescoes remain on the exterior surfaces of the piers, and these surfaces may not have been plastered or painted.

If we assume that there were no major changes made in the design of the church of St. John during the course of construction, and if we assume that the church was built according to fairly standard principles of symmetry generally found in Byzantine buildings, then the reconstruction of the features outlined above, which is directly derived from the extant visible evidence, can be accepted as reasonably certain. Other features of the church, on the other hand, can be reconstructed only with the aid of excavation, if they can be retrieved at all. These include the form of the original apse, the fenestration, the height of the building, and whether the church had a narthex, an atrium, or side aisles.

However, it is possible to draw preliminary conclusions concerning some of these features from the existing evidence and from comparable examples. For instance, it seems reasonable to assume that the clerestory lunette walls which closed the lateral arches on the exterior were located at the outer face of the arch rather than beneath the arch, for the intrados of one of the arches contains plaster and frescoes almost to its outer edge. Remnants of very thick mortar at the very outer edge of the lateral arch which sprang from the W side of the NW pier probably filled the open joint between the arch and the lunette wall. A further implication of this observation is that the clerestory walls probably continued vertically to a level at least as high as the apices of the extrados of the lateral arches.

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[12] LAMPAKIS, fig. 180 shows other comparable engaged pillars in his sketch plan. While these could be conjectural, it seems reasonable to assume that such piers were a recurring feature of the facades.

Perhaps more important is the question whether or not the church of St. John was built with side aisles and galleries. Two basic solutions for the side aisles and galleries should be considered. The first, which I have designated *inscribed aisles*, has side aisles and galleries between the major piers underneath the major lateral arches, the major parts of the aisles and galleries being connected with each other by passageways cut through the piers on an E—W axis[13]. The second solution, which I will call *additive aisles*, has aisles added to the exterior of the major piers. If the church of St. John had been built with inscribed aisles and galleries, then we would expect passageways inside the major piers on an E—W axis to make circulation at the gallery level possible. Such passageways clearly do not exist in the visible parts of the piers, which stand to a height of about 6.80 above present grade. On the other hand, in churches with inscribed aisles and galleries the galleries, including the passageways through the piers, are located almost immediately below the spring lines of the major vaults, and we may therefore conclude that the church of St. John was probably not provided with inscribed aisles and galleries[14].

A solution with additive side aisles and galleries seems to me to be almost as unlikely. The available evidence clearly demonstrates that neither vaulting nor a wooden roof were attached to the exterior sides of the visible parts of the major piers. In each case the cornice below the spring line of the major vaults stops upon reaching the exterior face of the pier; if the exterior pier face had been inside the church building, then we would expect the cornice to continue around that side of the pier also. Moreover, additive side aisles would have been poorly integrated with the nave and would have provided little view, for those in the aisles or galleries, of the bema area, and the outermost portions of the piers would have constricted the view even more than necessary. Indeed, the piers seem to be specifically designed to contain and concentrate the space underneath the domes, excluding the space beyond the piers, and implying that no part of the church existed there.

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[13] BUCHWALD, The Church 52ff. for a more detailed explanation of the term and examples.

[14] For instance, St. Eirene in Istanbul (W. S. GEORGE, The Church of S. Eirene at Constantinople. London 1912, pl. 4—7, and U. PESCHLOW, Die Irenenkirche in Istanbul. Tübingen 1977, pl. 1—6), Basilica B at Philippi (P. LEMERLE, Philippes et la Macédoine orientale. Paris 1945, pl. 40ff., 79ff.), the church of St. Elias at Pirdop in Bulgaria (P. MUTAVCHIEV, L'église du Cerf près Pirdope. *Bull. Soc. Arch. Bulg.* 5 (1915), fig. 11, 13, pl. 3), the church at Dereagzi in Lycia (H. ROTT, Kleinasiatische Denkmäler aus Pisidien, Pamphylien, Kappadokien u. Lykien. Leipzig 1908, fig. 112, and J. MORGANSTERN, The Church at Dereagzi: a Preliminary Report. *DOP* 22 [1968] fig. 5).

If we assume that the nave of the church was covered by only two domes, that these domes were equal in size, that the western piers had the same dimensions as the eastern piers, and that there were no side aisles, then the total dimensions of the church of St. John would be at least 25.81 × 49.87 m, without a narthex, and with a semi-circular apse enclosed by a wall 1.00 m thick. With these dimensions, and the very considerable diameter of the domes the church of St. John the Theologian in Alaşehir is one of the major vaulted monuments now known in Byzantine architecture[15].

3. Architectural Characteristics

Even though the visible remains of the church of St. John permit only a frustratingly fragmentary reconstruction of the original forms of the building, they are sufficient to enable us to make a number of observations concerning particular architectural features and qualities.

All of the available evidence, for instance, indicates that the spaces underneath both of the domes which covered the nave were exactly alike. Moreover, because of the unusual set backs in the plan of the piers and in the major arches each space was given its own specific identity and was separated discreetly from the other space. The nave must therefore have been unusually additive in character, each domed space existing like an independent module alongside the other space. This modular spacial sequence was underscored not only by the monumentality which must have been the dominant feature of each of the domed spaces, but also by the unusually plastic treatment of the piers and vaults.

The combination of stepped back piers with vaults stepped back so that they have approximately the same visible profiles as the piers is unusual in Byzantine architecture, and produces an equally unusual tectonic interior spacial effect. At Alaşehir the structural relationship between each portion of the vaulting solution and that portion of the pier which supports it (or seems to support it) is immediately clear to an observer inside the nave. Not only is the lower surface of the arch (intrados)

[15] The major dome of St. Eirene in Istanbul, with a diameter of over 15 m, is less than a meter larger than that of St. John, and the clear span of the major dome in Basilica B at Philippi has almost the same dimension as that of St. Eirene. The largest dome of St. John's at Ephesus is about a meter smaller than that of Alaşehir, with a diameter of only 13.55 m, and the other domes of St. John's are even smaller. The diameter of the central dome of San Marco in Venice is somewhat less than 13 m, and most middle Byzantine domes are considerably smaller. The dome of Dereagzi, for instance, spans only between 8 and 9 m.

displayed, as in most comparable Byzantine churches, but also the structural mass of the arch (extrados) is visible and becomes an important aspect of the interior spacial articulation. The visible mass, or thickness of the arch is in turn reflected directly in the profiles of the pier, each profile being designed as a counterpart, or continuation, of the arch it carries. The spacial modelling and articulation of the vertical surfaces of the nave were therefore expressed as an exact reflection of the vaulting solution, achieving an unusually strong continuity between the lower portions of the nave and the vaulting zone which is reminiscent, in some respects, of similar spacial relationships in Romanesque architecture. In the church of St. John this spacial modelling and vertical continuity may perhaps be interpreted as a conscious expression of structural relationships, and not as a consequence of structural necessity, because the major part of the loads and stresses developed by the vaults was introduced into the massive rubbled mortar core of the pier, which would probably have served its structural purpose equally well if a different plan had been used for the ashlar facing.

On the other hand it seems possible that the builders of the church of St. John *believed* that the ashlar facing of the piers was a crucial element in the structural security of the building. While the shell of the vault and the facing of the upper parts of the facades are made of brick, apparently because brick is lighter in weight and easy to handle, the lower parts of the piers are faced with ashlar, undoubtedly because ashlar holds up better than brick under heavy loading. The structural system of the church of St. John was therefore constructed in three zones: 1. a light weight upper zone was composed of the brick shell of the vaulting and the brick facade facing; 2. a lower zone was composed of ashlar facing on the piers; 3. a continuous zone of mortared rubble was packed inside the ashlar facing of the pier and behind the brick shell of the vaulting as well as behind the brick facade. The wooden tie beams which were used inside the mortared rubble core seem to demonstrate that the builders were aware of the necessity of obtaining structural cohesion within the piers.

4. Comparable Examples

A detailed analysis of the forms of the church of St. John within the broad context of the Byzantine architectural development will be the subject of a future paper. The comparable buildings and architectural forms are too many and too complex to include in the present investigation without unduly delaying the publication of this important building. I wish, nevertheless, to make the following brief and tentative observations as a kind of thumb-nail outline and interim report on "work in progress".

1. The plans and vaulting solutions of the following buildings appear to have basic features in common with the church of St. John:

A. St. Eirene in Istanbul, built after 532, with subsequent building phases probably in the 560's and after 740[16];

B. Basilica B in Phillipi, dated to the 530's or 540's for stylistic reasons[17];

C. the church of St. Elias near Pirdop, dated to the late 6th or early 7th century on stylistic grounds[18];

D. church D at Sardis, which must have been constructed before the Persian devastation of the city in the early 7th century[19].

E. The churches of St. John at Ephesus and of the Holy Apostles in Constantinople, both associated with Justinian, are comparable with the church at Alaşehir because they were built using a similar principle of modular bays which were approximately equal in size and which were covered by domes[20]. Their cruciform plans are not, of course, comparable with the plan of St. John's at Alaşehir.

The similarities between all of these churches and the church of St. John at Alaşehir suggest that the church of St. John may have been constructed in the Justinianic period. It seems reasonable, at any rate, to assume that it was not built after the Persian destruction of the area in the early 7th century, even though Philadelphia need not necessarily have been devastated[21].

However, other possibilities for dating the church of St. John must also be considered. A group of churches with three or more domes over the nave, for the most part on Cyprus, has been collected by G. A. Soteriou, and these churches also lend themselves to a comparison with the church at Alaşehir[22]. While several, and perhaps all of the churches are probably medieval in their present forms, the most important and probably earliest church of the group, St. Barnabas near Famagusta, was initially constructed in the

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[16] See fn. 4.

[17] Ibid.

[18] Ibid.

[19] This important monument will be published by L. VANN in the volume *The Churches of Sardis*, in the series *Archaeological Exploration of Sardis* (Cambridge, Mass.); also H. C. BUTLER, Sardis I, The Excavations, Part 1: 1910—1914. Leyden 1922, 29f. Its nave was covered by two domes, oval in plan and slightly smaller than those of Alaşehir, constructed of brick and supported by six ashlar piers. C. FOSS, Byzantine and Turkish Sardis. Cambridge, Mass. 1976, 53ff. for the destruction of the city.

[20] Procopius, Buildings, I 4, 9ff. for the church of the Holy Apostles; *Forschungen in Ephesos* IV 3 for the church of St. John at Ephesus; C. FOSS, Ephesus after Antiquity: a Late Antique, Byzantine, and Turkish City. Cambridge 1979, 87ff. for an account of the history of the building with relevant sources.

[22] See fn. 11.

late 5th century and a reconstruction of the 5th century church with three domes has been suggested[23].

An attribution of the basic features of the plan and vaulting solution of St. Barnabas to the late 5th century, on the other hand, permits the intriguing conjecture that the church of St. John at Alaşehir was not a provincial version of forms developed in Constantinople during the Justinianic period, but rather, that it may represent a pre-Justinianic architectural development in Asia Minor which eventually reached the capital during Justinian's reign.

2. The basic structural system of St. John's, composed of a mortared rubble core faced below by ashlar masonry and above by brick vaulting has been shown by Deichmann to be typical of Justinianic Constantinople, and to have its roots in Asia Minor[24]. F. Fasolo convincingly demonstrated that the same system was used extensively in Ephesus and the surrounding parts of Asia Minor in the late Roman period[25]. There is a missing link, however, between the late Roman examples in western Asia Minor and the Justinianic examples in the capital, built some two centuries later. While a pre-Justinianic date for the church at Alaşehir would by no means fill such a vast lacuna, it could be a valuable clue to how, and where, additional evidence may be found.

Indeed, the shape of the pier at Alaşehir may be another clue in resolving the same issue. Pier profiles with reëntrant angles are not common in Byzantine architecture, but are found, in a somewhat simpler form, in church D at Sardis, not far from Alaşehir. The same simpler profile used in church D is found again, in turn, in building C in Sardis, which may have been built in the 3rd or 4th centuries, and which was constructed with three brick vaults which were supported by ashlar piers[26]. While the existence of monuments such as buildings C and D at Sardis certainly does not imply that the church of St. John at Alaşehir was built before Justinian's reign, it does make it probable that the church of St. John was built within a strong local tradition, with the implication that the forms of the church may have been developed locally.

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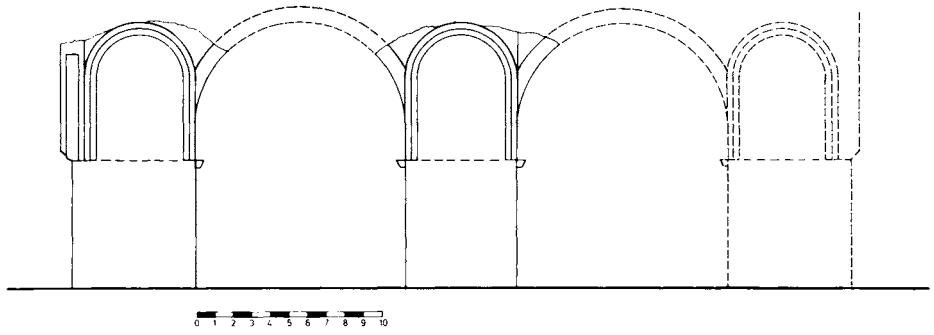
[23] Ibid. 402ff., with further references.

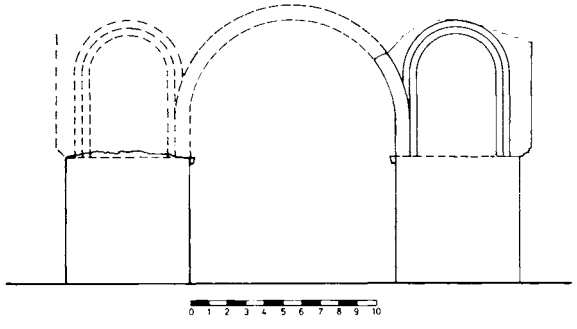
[24] F. W. DEICHMANN, Studien zur Architektur Konstantinopels im 5. u. 6. Jahrhundert. Baden Baden 1956, passim.

[25] F. FASOLO, L'architettura romana di Efeso. Roma 1962; IDEM, La Basilica del Concilio di Efeso. *Palladio*, n. s. 5—6 (1957) 1ff.

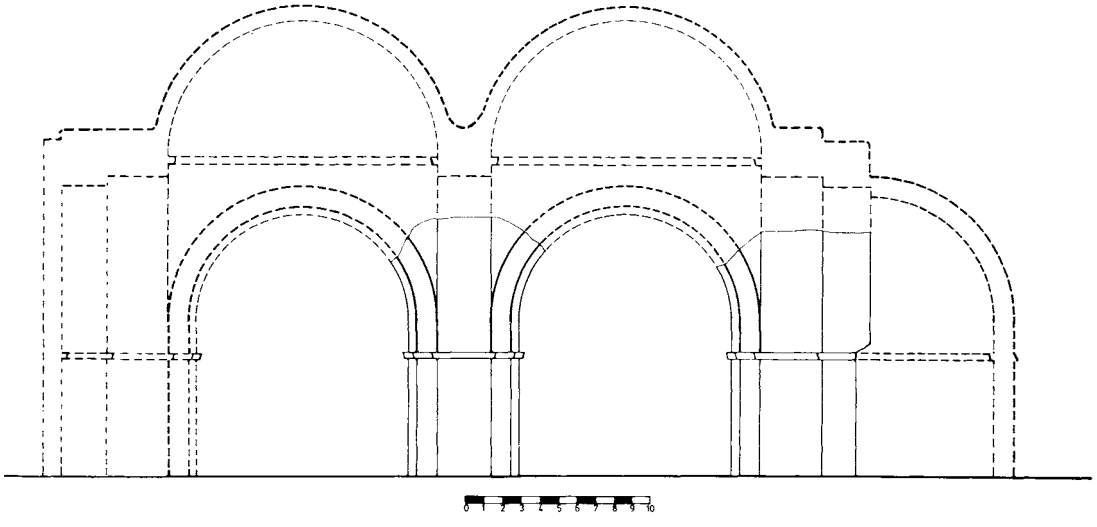
[26] This monument will also be published by L. VANN in the series *Archaeological Exploration of Sardis* (fn. 19 above.) It has not been excavated but the piers of one side of the building are well preserved and visible above grade. The purpose of the building is unknown.



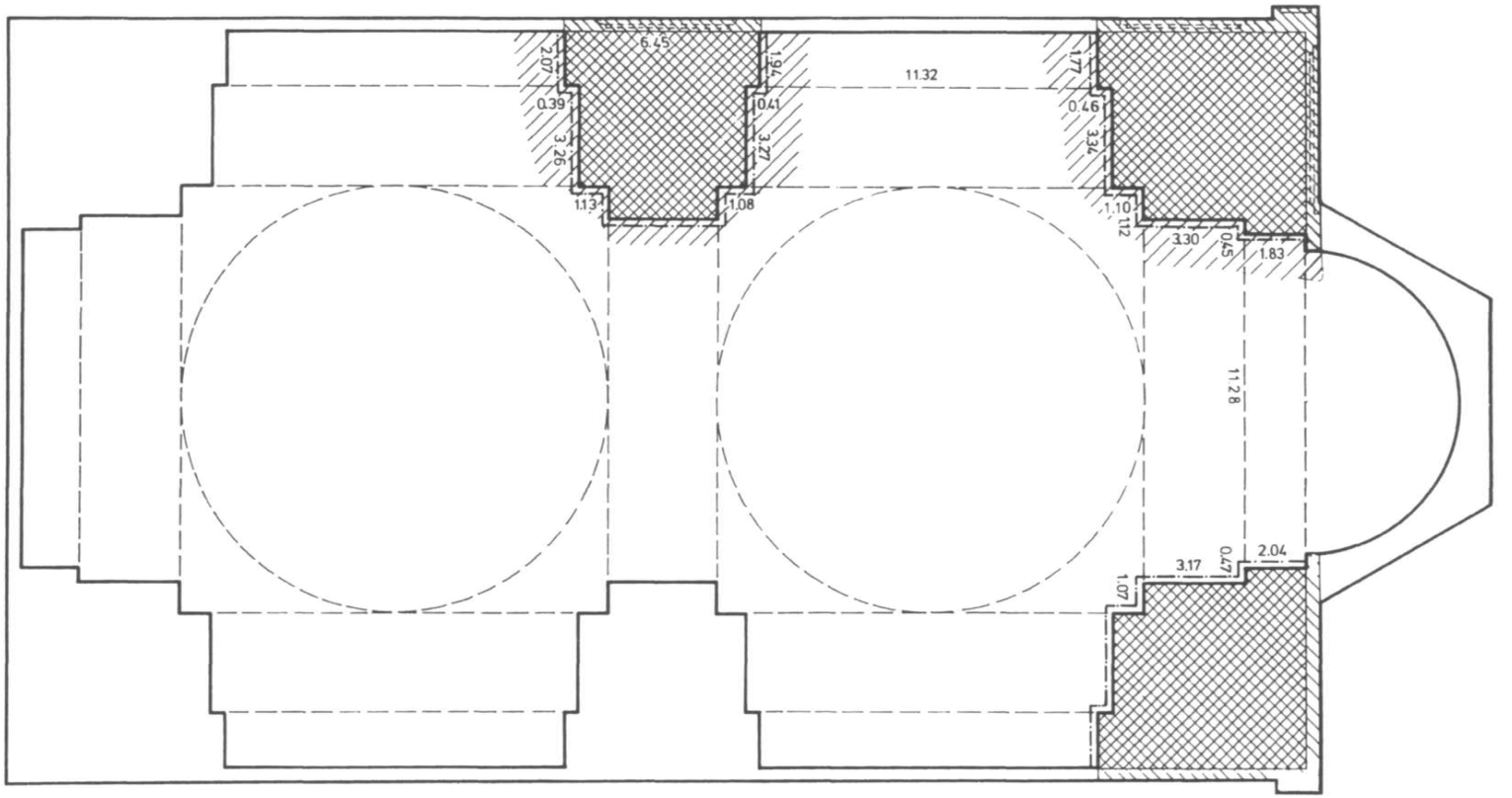
1. Schematic North Elevation of the Visible Remains (partly restored)



2. Schematic East Elevation of the Visible Remains (partly restored)



3. Schematic Section through the Visible Remains (looking north, partly restored)



4. Schematic Reconstructed Plan

5. NE and NW Piers from NW

6. NE Pier from SSW

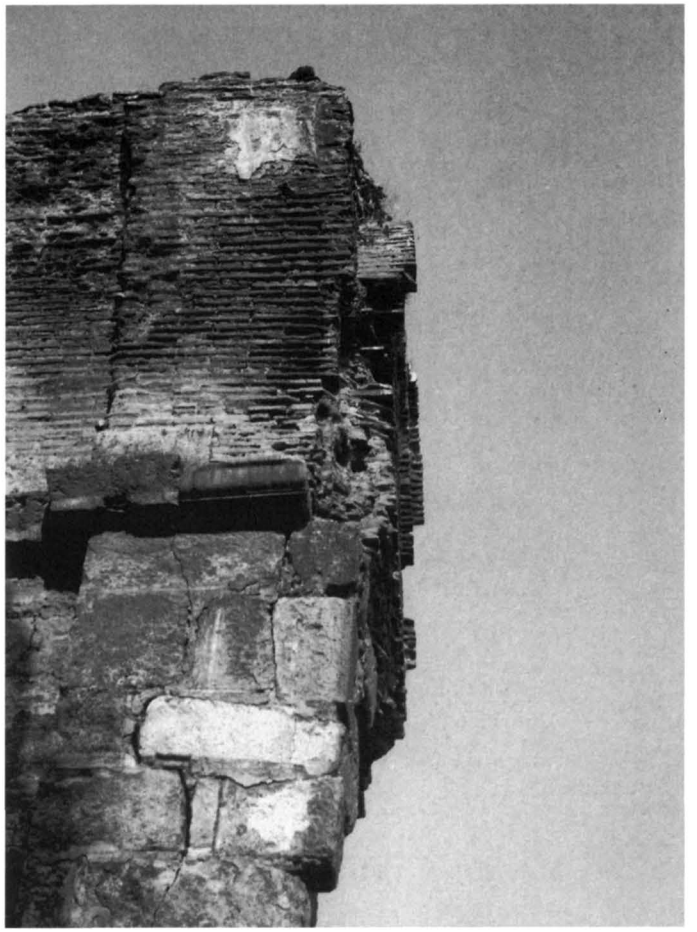
7. NE Pier from SSE — Detail

8. NE Pier from W — Detail

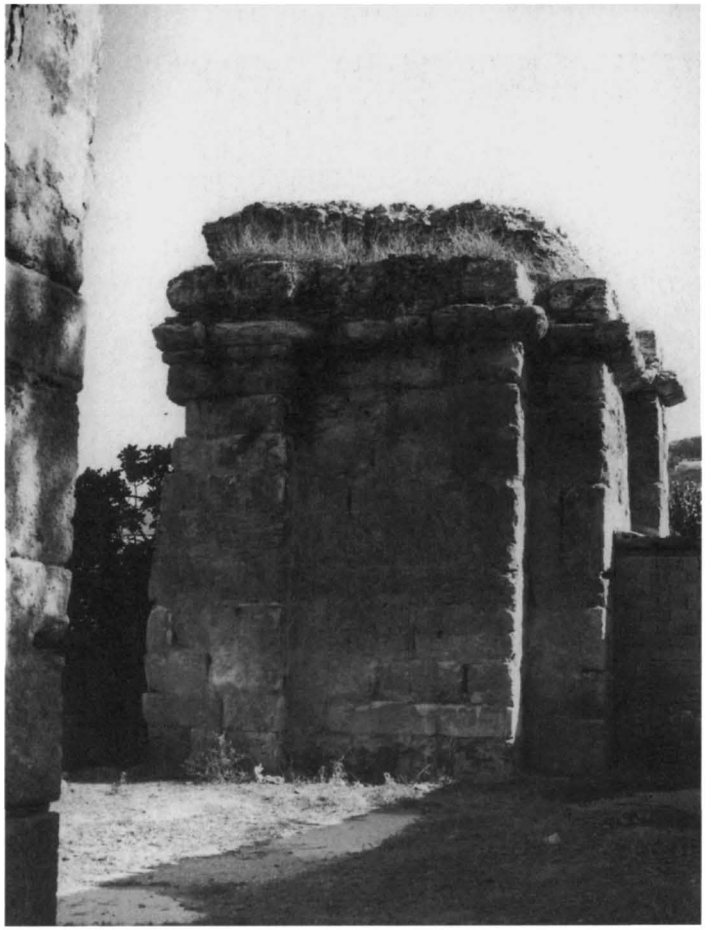
9. NE Pier from NW

10 NW Pier from NW

11. NW Pier from W

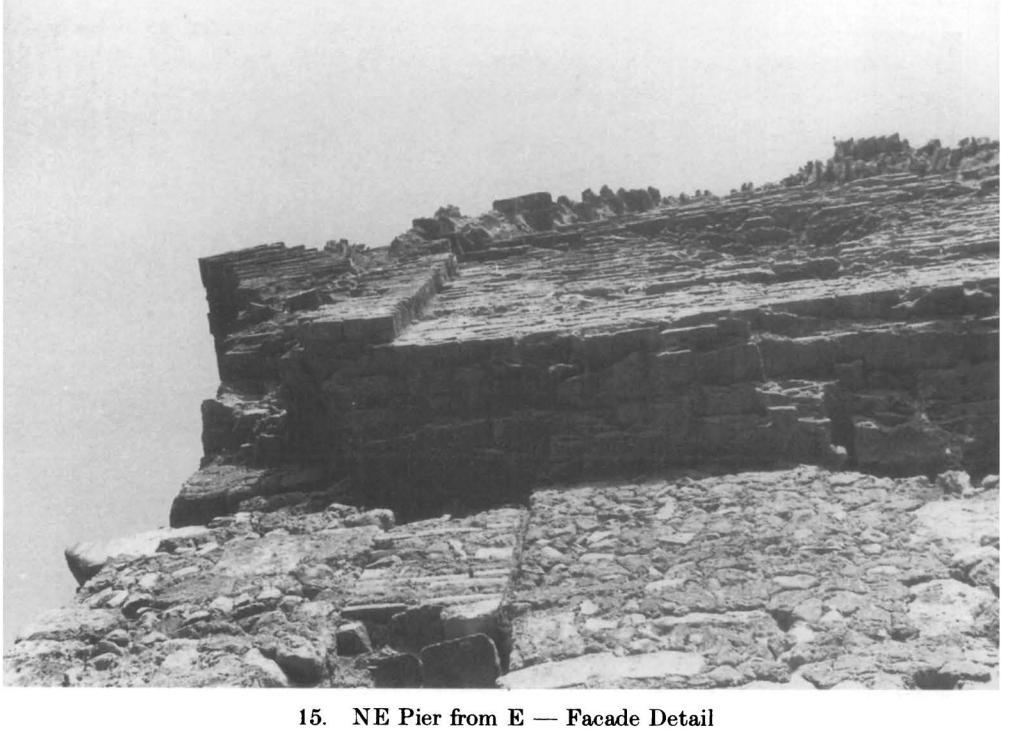


12. NW Pier from E — Detail

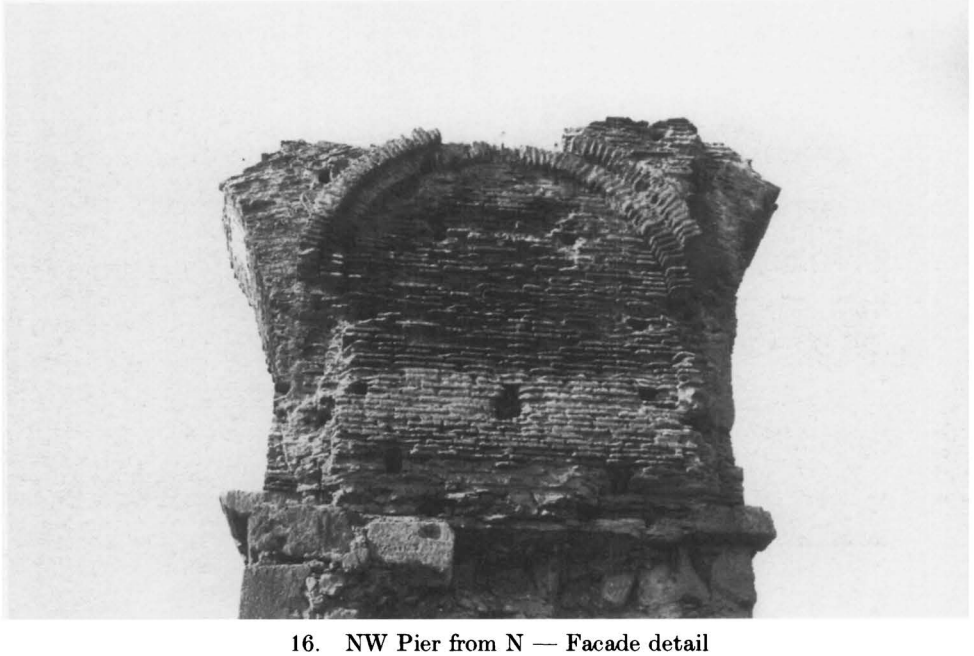


13. SE Pier from NNW

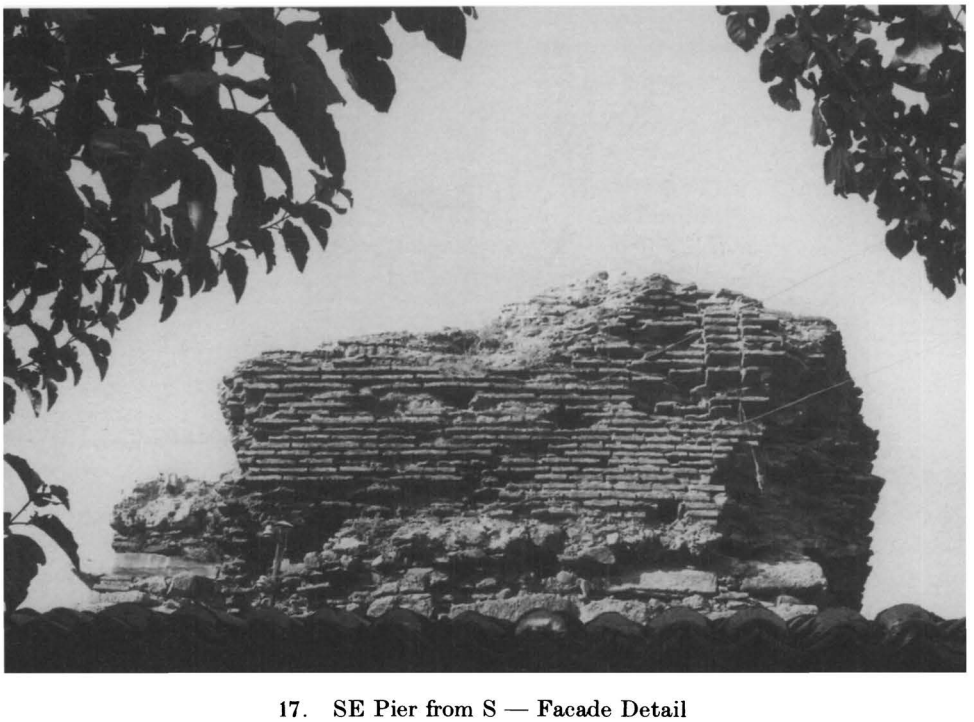
14. NE Pier from N — Facade Detail



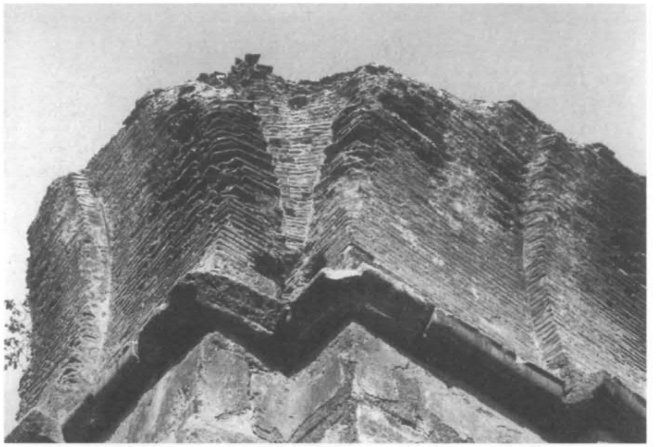
15. NE Pier from E — Facade Detail



16. NW Pier from N — Facade detail

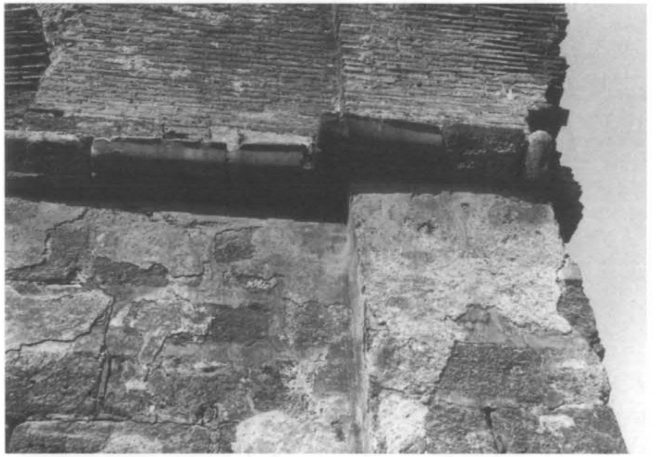


17. SE Pier from S — Facade Detail



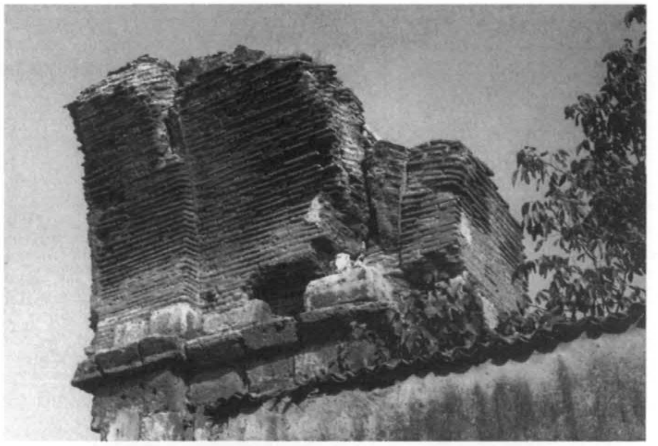
18. NE Pier from SW — Vault Detail

19. NE Pier from W — Vault Detail



20. NE Pier S Face from S — Detail

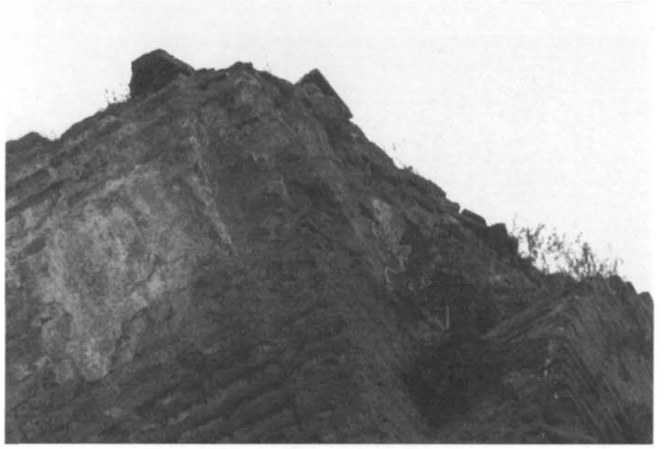
21. NE Pier W Face from W — Fresco Detail



22. NW Pier from SW — Vault Detail

23. NW Pier upper NW Corner from NW — Detail

24. NW Pier N Face from NW — Detail



25. NW Pier upper NE Corner from NE — Detail

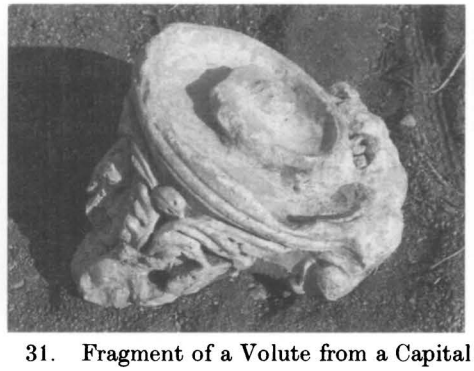
26. NE Pier W Face — Fresco Detail

27. NW Pier W Face — Detail

28. Ornamental Carved Marble Fragment

29. Ornamental Carved Marble Fragment

30. Ornamental Carved Marble Fragment



31. Fragment of a Volute from a Capital

III

SARDIS CHURCH E — A PRELIMINARY REPORT*

With eight plates

To the Memory of
H. Detweiler and G. Swift

I. Description

Fragments of church E visible west of the road leading to the Artemis precinct were noted by H. C. Butler, head of the American excavations of Sardis between 1910 and 1914[1], who gave the building its present designation. Based upon the scant but clearly recognizable remains of several small domes Butler speculated with uncanny accuracy that the building had been a Middle Byzantine inscribed cross church with five domes. Church E was excavated in 1962 and 1963 by M. Del Chiaro and H. Detweiler of the Harvard-Cornell Archaeological Exploration of Sardis[2]. In 1972 I was asked by Prof. G. M. A. Hanfmann, director of the excavation, to act as advisor for any additional excavation which may be necessary and to clarify the building's history and place in the development of Byzantine architecture.

Excavations subsequently carried out in 1972 and 1974 under A. Ramage and G. M. A. Hanfmann uncovered additional evidence useful for the reconstruction of church E and an Early Christian basilica, designated church EA, which was the predecessor of the Middle Byzantine church[3]. A detailed

* I am most grateful to Prof. George M. A. Hanfmann, director of the Harvard-Cornell archaeological Exploration of Sardis for giving me the opportunity to participate in the excavations and to examine all of the available evidence concerning church E during the seasons 1972 to 1975. I am also indebted to my friends and colleagues at the excavation who contributed their time and effort; without their help my work would have been impossible. My thanks are also due to the National Endowment for the Humanities, which supported this work with a series of grants.

[1] H. C. Butler, Sardis I, The Excavations, Part I: 1910—1914. Leyden 1922, 33.

[2] *Bulletin of the American Schools of Oriental Research* 170 (1963) 15f.; 174 (1964) 14—20. The plans published in 1963 (Fig. 13) and 1964 (Fig. 8) were drawn before the excavation had been completed and are incorrect in numerous details. The reconstruction attempted in 1964 (p. 19 and Fig. 9) was also based upon insufficient evidence.

[3] Ibid. 215 (1974) 33—41; this important church will be treated in detail in the Final Report of the Archaeological Exploration of Sardis.

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description and analysis of both churches will appear in the series Archaeological Exploration of Sardis[4].

1. Plan and Vaulting System

In spite of the almost total destruction of church E, undoubtedly by an earth quake, with the aid of an analysis of numerous masonry fragments found in the rubble of the church it is possible to describe the plan of the building, most of its vaulting system, its articulation, and the ornamentation of its facades with considerable certainty[5].

The major features of church E were organized on the principle of the typical Middle Byzantine inscribed cross church plan. Its exterior dimensions are (approximately) 10,95 × 19,10 meters. A full bay for the bema was inserted between the apse and the eastern cross arm (Fig. 3). Six rather than the usual four columns support the vaults of the nave and side aisles, for columns rather than walls divided the bema from the flanking chapels. The nave therefore had an unusually elongated, basilical character. A narthex preceded the nave, three openings, roughly on the axes of the nave and side aisles, connecting the two spaces. Doors led from the exterior into the narthex from the west, north, and south, and into the nave from the north and south. Evidence of windows exists in the major bays of the northern and southern facades and in the southern bay of the western facade.

The major dome was flanked diagonally by four smaller domes on low cylindrical drums probably without windows. While only a single fragment of the major dome, too badly battered to clearly recognize its features, was found in the church debris, all four of the minor domes were found in relatively good condition (Fig. 11, 12). One of them was found with its crown toward the ground in the central bay of the church, portions of the blockish superstructure over its pendentives still clinging to the masonry of the drum (Fig. 11). The location of ornamentation on two finished surfaces of the superstructure and on the drum, as well as the dimensions of this dome permit the conclusion that it originally covered the north western bay of the naos. Although only the impression of the barrel vault which covered the eastern bay of the nave was preserved in one of the masonry fragments, extensive remains of pendentive domes which occupied positions over the eastern bays of the side aisles were

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[4] Archaeological Exploration of Sardis, Cambridge Mass. and London, G. M. A. Hanfmann and S. W. Jacobs, general editors.

[5] I am particularly grateful to K. Paul Zygas and Edward D. Russel of the Archaeological Exploration of Sardis whose patience and skill made the accurate measurement of the building and of the masonry fragments found in the rubble possible.

identified in a context which permits no doubt concerning their original locations[6]. All of the extant domes had elliptical profiles and smooth interior surfaces: the domes were neither ribbed, nor mellon shaped. Unfortunately no direct evidence was found to indicate what form of vaulting was used over the narthex.

2. Wall Articulation

The walls of the naos were articulated by pilasters on the interior more or less on the axes of the columns. The eastern and western narthex walls, on the other hand, were probably articulated by pilasters which divided the narthex into three bays spaced so that the central bay is almost square in plan, perhaps indicating that it was covered by a dome[7].

The northern, southern and western facades of the church were richly articulated by blind arcades with stepped profiles, a reflection of the interior organization and of the structural system of the building. The richness of the profiles seems to have been planned according to a rhythmic "hierarchical" system of importance, in which the more important features of the church were emphasized by the richer profiles of their blind arcades. On the lateral facades, for instance, the profiles of the pilasters flanking the central bay, the bema bay, and the narthex are stepped three times while the profiles of the intermediate bays are stepped once or twice[8]. The simple rhythmic interplay achieved by this device no doubt added to the richness and subtlety of the exterior articulation.

Only the eastern facade of church E was not articulated by blind arcades reaching down to the foundation or stylobate. While the flanking apses were

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[6] The reasons for the attribution of the various masonry fragments to specific locations in the church can be understood only with the aid of an analysis too detailed to include in the present investigation. It will be published in the Final Report of the Archaeological Exploration of Sardis.

[7] The interior surfaces of the narthex walls are poorly preserved and it is difficult to be certain about the exact shape and location of these pilasters. The typical irregularities in the masonry, most of which are ignored in the reconstructed plan of Fig. 3 were no doubt partly corrected by the application of plaster to the walls, and partly ignored by the builders. P. 281ff. below for stylistic evidence concerning the vaulting of the narthex.

[8] The eastern end of the north facade is very poorly preserved and cannot be reconstructed with the same degree of certainty as other portions of the facades. The arcade profile stepped twice rather than three times shown in Fig. 3 is based upon tentative evidence which must not necessarily be accepted. However, even if the profiles of this arcade were stepped only twice it would not discount the use of the system described here, for medieval builders were frequently erratic for reasons which can no longer be ascertained.

circular in plan and had smooth, cylindrical surfaces the major apse had five sides which were disposed somewhat asymmetrically and articulated in their upper portions by six recessed blind arcades. The fact that two arcades were located in the central facet of the apse, on the major axis of the church, may indicate that a binate window was located below the arcade in the center of the apse, although no other evidence exists to verify this observation.

3. Facade Ornamentation

The richness of the exterior articulation of church E was enhanced by the application of an equally rich repertoir of brick or ceramoplastic ornamentation. Friezes of quatrefoils made of small hollow clay pipes with pinched ends, inserted vertically into the masonry were frequently used, adding a linear chiaroscuro emphasis to the facade articulation. While a single such frieze was used around the outer arches of the laterial facades, two parallel friezes separated by a course of bricks were used around the outer arches of the blind arcade on the major apse and on the blockish superstructure over the pendentives of the minor domes[9] (Fig. 13, 15). The use of this ornamental motif was probably originally more extensive than the few extant remains would indicate.

Each of the four lunettes of which remains were found in the church debris was decorated with a checkerboard pattern made of bricks inserted vertically into the masonry. Every second brick, both vertically and horizontally, was somewhat smaller or broken, and inserted with its face slightly behind the outer surface of the lunette; these bricks must have been covered with plaster, for some of them are so fragmentary, even though the lunette itself is in exceptionally good condition, that it is unlikely that they were exposed to view (Fig. 13, 14)[10].

In contrast to the lunettes of the flanking facades those of the major apse

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[9] Only the broken stumps of the clay pipes or the cavities left by the pipes in the masonry were found *in situ*. However, a great number of clay pipes, some in almost perfect condition, were found in the church debris during the excavation.

[10] While three of the lunettes were found in the rubble near those areas of the facade from which they fell, the fourth was built into a wall of the so-called second or upper Turkish village, which was excavated in 1962. This village was apparently built in the 17th century over the walls of an older Turkish village which had made use of church E in an altered form, perhaps for industrial purposes. The second village must therefore have been built after the earthquake which destroyed church E and which must, accordingly, have been the great earth quake of 1595 which is reported to have levelled Sardis. Church E cannot, then, have been in use during the occupation of the second village, as is sometimes assumed. C. Foss, Byzantine and Turkish Sardis. Cambridge, Mass.—London 1976, 97 for the history, sources, and further references.

were decorated with herringbone patterns made of bricks which had been carefully trimmed to fit their positions (Fig. 15). A herringbone or similar brick pattern seems also to have decorated the only remaining, unfortunately very poorly preserved spandrel. It occupied a position near the south eastern corner of the south facade, above the eastern blind arcade. A brick chevron frieze decorated the exterior of the northern apse at about the same height as the pendentive dome which covered the eastern bay of the north aisle (Fig. 16).

The drums of the four minor domes were decorated by simple meander bands which do not continue around the entire drum, but only around those portions of the drums which were readily visible. The meander was created by placing long bricks in a vertical position at equal distances from each other and closing the interstices alternately at the top and bottom with horizontally placed bricks. The area between the vertical bricks was filled with smaller bricks and brick chips with their outer faces set slightly behind the surface of the meander band and covered with plaster. Here portions of the plaster covering were well preserved, in contrast to that of the checkerboard patterns. The north western dome was also decorated with a single brick dentil frieze located immediately above the meander and below the roof line, a feature which was not used on the other domes. On the drum of the dome which probably originally covered the south eastern naos bay a second, smaller meander band was added just below the first in such a manner that both may be read as a single integrated pattern (Fig. 12).

The brick ornamentation of church E seems to have been characterized not only by its richness and variety, but also by its application in an unusually ordered and systematic manner. The drums of all four minor domes were decorated with a single motif, a meander band, and all four extant lunettes were also decorated with a single motif, a checkerboard pattern. Several well preserved areas of brick ornamentation permit the conclusion that it was executed with great skill, care, and precision.

4. Construction

All extant portions of the masonry, including the vaults, were constructed of mortared rubble faced with brick or brick mixed with ashlar blocks of marble. All of the walls must have been built at the same time not only because of the uniform character of their masonry, but also because the masonry is continuous throughout, fissures or other joints occuring neither in the rubble core nor in the facing. While the upper portions of the church, the drums of the minor domes, the vaults, the blind arcades and the ornamentation were built or faced entirely with brick, ashlar blocks were used together with

brick in lower portions of the walls. The lowest courses of the southern and western facades, the only facade areas which are preserved extensively enough to obtain at least a fragmentary impression of their original character, were built of alternating layers of brick and well cut large ashlar blocks only occasionally separated by single vertical bricks reminiscent of the so-called cloisonne technique.

Whatever the aesthetic or decorative effect of this manner of construction may have been, it provided the builders of church E with two distinct advantages. First, the use of brick rather than stone in the upper parts of the building lightened the dead load and the thrust bearing on the lower walls, and second, its use in the vaults and arches permitted their construction with reused building material without the necessity of recutting it. The structural system was given additional firmness by long horizontally placed timbers about 10×10 cm in section which were built into the masonry between and on the sides of the lower vaults, on both axes of the columns and in the wall dividing the naos from the narthex. Cavities left by these timbers, which extended to the facades, were found in a number of masonry fragments excavated in the rubble of the church (Fig. 6, 11).

All of the building material used in the construction of church E seems to have been reused, for the sizes of the ashlar blocks and bricks as well as the colors of the bricks are erratic and broken fragments are more common than whole members even in well preserved surfaces. Frequently ashlar blocks or bricks which appear to be in perfect condition when seen in the facade have broken surfaces which were turned towards the rubble core of the wall during construction. Great care was taken in sorting and choosing the ashlar blocks and bricks, however, particularly in those areas of the facade which were crucial for the appearance of the building, such as the blind arcades and the brick ornamentation. The careful choice and juxtaposition of ashlar blocks and bricks in the lower portions of the facades created a collage-like surface which was richly polychromatic and which must have been most attractive.

While the mortar used throughout the church was firm and of high quality, it was adjusted to suit different purposes in different parts of the masonry by the addition of finer or less fine aggregates. The aggregates used were crushed marble or stone and river sand or very small pebbles, but not crushed brick, and the mortar is therefore fine in texture and light or medium grey in color. The proportion between the heights of the bricks and of the mortar joints varies considerably because of the erratic dimensions of the bricks. Bricks ranging in height from 4 to 6 cm were frequently used with mortar joints ranging in height between 3 and 5 cm, giving a numeric relationship roughly between 1 : 1 and 1 : 0,5. The visual impression given by the brickwork is that the bricks are somewhat higher than the mortar joints.

The mortar joints were slightly raked in most areas which were well preserved, including many areas which were not originally exposed to view, indicating that the raked joint was used for technical rather than aesthetic reasons. In a raked joint water would be less likely to penetrate between the lower edge of the brick and the top of the mortar, the free lower edge of the brick acting somewhat like a drip-cap. The aesthetic qualities produced by the accompanying setting off of the brick from the mortar joint and the horizontal shadow line may, of course, also have been valued and exploited by the builders[11]. The mortar joints of the meander bands, which were very well preserved in some places, were filled with particularly fine and hard mortar and were raked with enormous skill and precision in such a manner that, while the major part of the surface was parallel with the surface of the wall, the horizontal and vertical edges of the joint slanted toward the adjacent bricks, setting the bricks off from the mortar joints with a subtle shadow line.

5. Use of the Quadratura

An unusual feature of church E is that its major dimensions appear to be related to each other according to the principal of the *quadratura*, a geometric system of proportion known until now in medieval architecture above all through its use in the 13th century sketchbook of Villard d'Honnecourt[12] and in the late 15th century treatise on the construction of Gothic finials by Matthias Roriczer[13].

The basic unit is a square drawn through the centers of the four major columns supporting the central dome of the church (Fig. 7). This square may be diagonally inscribed into a larger square with its corners at the inner faces of the western, northern, and southern walls of the naos. This square, in turn, may be diagonally inscribed into a still larger square which defines the outer edges of the nine central bays of the nave. Finally, the eastern and western corners of a still larger square, into which this square may also be diagonally inscribed determine the inner faces of the major apse and of the western wall of the narthex.

It must be emphasized that these relationships were closely checked with surveying instruments in the church itself, and not merely established on the basis of reconstructed plans. Accurate measurement was made particularly easy by the fact that neither the walls nor the columns stand in the way of

[11] H. Buchwald, The Church of the Archangels in Sige near Mudania. Vienna 1969, 58f. for the relevance of these features and further references.

[12] H. R. Hahnloser, Villard d'Honnecourt. Graz—Vienna 1934, 2nd ed. 1972.

[13] Matthias Roriczer, Das Büchlein von der fialen Gerechtigkeit. Regensburg 1486 (Facsimile Wiesbaden 1965, F. Geldner, ed.).

sight lines. While the corners of the squares are not always exactly 90°, the divergences are so minor that they must be explained by the primitive surveying methods available to the builders and by the typical irregularities in the walls of the church[14].

6. Interior

Mosaic tesserae and fragments of fresco as well as of colored glass found in the rubble of the church indicate that the interior of church E was decorated as lavishly as the exterior. Unfortunately none of these remains is sufficiently well preserved to permit a reconstruction or a stylistic analysis. Because at least some of the tesserae are made of glass and gold leaf they must come from a mosaic which was applied to the walls or vaults rather than to the floor. On the other hand, patches of fresco in one of the corner domes show that the use of mosaic was limited, perhaps to the apse or to the major dome. The only recognizable features in the fresco are geometric frames and ornamentation.

Even though most portions of the church floor were removed before the final destruction of church E, small patches of the original floor, made of large blocks of reused marble were found *in situ* in several parts of the naos and narthex. However, thin pieces of marble cut in square and diamond shapes about 5 to 10 cm long, which may have come from an *opus sectile* floor were also found in the rubble. This type of flooring may, therefore, have adorned an important area of the church such as the apse or the center of the nave[15].

Only a single fragmentary column shaft was found in the excavation, the others probably having been salvaged for reuse or for the lime kilns after the final destruction of the church. On the other hand, five of the six column bases were found *in situ*. Not only were all reused spoils, but each is somewhat different in size and profile, probably indicating that at the time church E was built material in good condition from Late Classical or Classical buildings was no longer readily available in large quantities. The two columns closest to the apse were larger than the others, perhaps for aesthetic reasons, for even in Middle Byzantine times it must have been evident to the builders that the columns underneath the major dome carried greater loads. Conceiv-

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[14] See also p. 299.

[15] Mosaic tesserae, pieces of colored glass, and the remains of the *opus sectile* floor were found not only in the debris within the church, but also in rubble which had been used to fill a byzantine pit built into the naos of the church (p. 275f. below). The same rubble contained pieces of the dismantled altar screen, and the pit must therefore have been filled at the time the church was desecrated and converted into a Turkish domestic or industrial building. The mosaic and the *opus sectile* floor were, then, apparently destroyed at that time.

ably the builders were a bit hesitant about replacing the solid masonry walls usually found in this position with a column, and therefore chose sturdier dimensions in spite of the dictates of simple structural logic.

The best preserved feature of the interior furnishings of church E is the epistyle of an altar screen which owes its excellent condition to the fact that it was dismembered and reused in the foundations of unmortared Turkish masonry. However, because its carving does not directly bear on the architecture of church E, and because major portions of the epistyle belong to earlier periods it will be best dealt with in a separate paper.

7. The Foundation

Several trenches were dug into the foundations in 1972 in an effort to learn more about Middle Byzantine construction methods. In addition to the major foundation walls underneath the walls of the church a number of subsidiary foundation walls divided the area underneath the naos into small rectangular units (Fig. 4). The intersections of these subsidiary foundation walls were located underneath the supporting columns of the church. The foundation walls vary in thickness between about 0,80 and 1,70 m, and were carried down vertically without footings to a height between about 1,30 and 2,00 m below the floor of the church. The thicker and higher walls stand underneath the walls of the church on the floor or sub-floor of church EA, which appears to have been in use until the construction of church E[16]. The rather enormous dimensions of these walls indicate that the builders of church E were quite aware of the importance of well built foundations for the structural stability of the church.

With one important exception which will be described below, all of the foundation walls were faced with brick and ashlar generally similar to that of the other walls of the church. Their construction differs from that of the church walls only in that brick was used here very sparingly and in that crudely prepared stones and field stones are rather common. The rich collage effect of the church facades is found in the foundations only on the exterior of the western wall, perhaps an indication that this side of the foundation was meant to be seen rather than to be filled in with earth[17]. While the exterior walls are

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[16] Repairs were carried out within church EA in masonry rather similar to that of church E. Comparable masonry elsewhere can be dated to the same general period. This evidence will be presented in the Final Report on church EA.

[17] This conclusion is corroborated by the fact that pieces of the dismantled altar screen of church E were reused at a level more than 1.00 m below the floor of the church in the roughly built unmortared foundation of a Turkish wall immediately west of the western facade. Because it is unlikely that the Turkish builders excavated a trench to

neatly bonded at the corners and the inner walls are bonded at their intersections underneath the columns, the major cross walls are not bonded with the exterior walls and the subsidiary inner walls are bonded neither with the exterior nor with the cross walls, except occasionally in the lowest portions of the foundation[18]. The foundation was therefore apparently conceived as structurally independent units, perhaps in an effort to counteract the negative effects of unequal settling in unequally loaded members. Those portions of the foundation which carried greater loads would settle more quickly, creating stresses which could cause cracks in the foundation and subsequently in the church if the entire foundation were built as a single structural unit. Because of the construction of the foundation in structurally independent units each portion of the building (the exterior walls, the wall between the naos and narthex, the four central columns, the two columns closest to the apse) could settle at a different pace without causing this type of structural problem. Because of their relatively fluid construction of brick with large mortar joints and mortared rubble the vaults, on the other hand, were not seriously affected by the uneven settling.

The spaces between the foundation walls were filled with relatively clean earth and clay mixed only occasionally with potsherds and pieces of broken stone. Stamped clay floors were found at different levels in some of the compartments, indicating that the foundation walls were built in horizontal layers; after the walls had been built to a height which was no doubt determined by how high the building blocks could conveniently be lifted (about 60 to 80 cm) the interstices were filled with earth and clay to facilitate the construction of the next horizontal layer. This method of construction had three advantages: first, it avoided the necessity of building scaffolds; second, the fact that each successive layer of fill was packed and compressed by the workmen in the course of construction avoided uneven settling in the church floor; third, the clean, tightly packed fill added stability to the foundation.

Timbers about 10×10 cm in section joined by iron spikes at their intersections were laid in both directions in a thick layer of cement mixed with brick and tile chips on top of the foundation walls. Although the wood itself had entirely disappeared, the cavities left by the timbers, occasionally preserving even the imprint of the wooden grain, and numerous iron spikes which

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construct their rude foundation wall, this area must have been free of fill down to the bottom of the wall until the Turkish occupation of the building.

[18] Seven wall intersections were examined below grade in 1972. Only in the lower 80 cm of the intersection between the north wall and the eastern cross wall was a crude splayed footing of large rough field stones, bonded with both walls, found. Some of the other foundation walls diminished in height toward that end of the wall which was terminated with an open joint.

were found near their intersections permit no doubt concerning the original appearance of this unusual structural feature (Fig. 4, 9)[19]. Its purpose seems to have been to add cohesion to the structural system, for the wood would bear the tensile stresses better than the rubbled mortar, which is best suited to bear compression. The behavior of the timbers would, then, have been somewhat comparable with that of steel reenforcing rods in reenforced concrete. The tight packing of the timbers in particularly high quality, hard cement implies that the builders were aware of the necessity of combining the structural qualities of both materials, the timber and the mortared rubble, to obtain optimum structural efficiency.

8. The "Pseudo-crypt"

A small pit about 1,29 × 1,73 m with a depth of about 1,22 m below the level of the original floor was located in the central bay of the south aisle of church E, against the south wall and the south western pilaster. It was entered by steep steps at its western end which lead southward from the floor of the naos to the floor of the pit. The pit must have been built at the same time as the church in spite of the fact that its walls are not bonded with those of the foundation not only because it was built with masonry the same in character as that of the church walls, but also because its southern side is recessed into the south wall of the church, indicating that the pit was already planned when the south wall of the church was under construction.

Extensive remains of plaster and numerous fragments of fresco belonging to at least four different periods are extant on the walls of the pit. Unfortunately, all of the recognizable features are purely decorative in character and do not lend themselves to stylistic analysis. Two important conclusions may nevertheless be drawn from the frescoes: first, the pit must have been open to the church, for the frescoes continue on the south wall without interruption from the floor of the pit to a level much higher than the floor of the church; and second, the earliest layer of fresco must precede the construction of church E, for it continues westward on the recessed south wall of the pit to a point 6 cm beneath the masonry of the adjacent south wall of the church. This surprising apparent discrepancy is explained by the fact that the masonry of the south wall of the pit belongs to an extensive medieval repair of church EA; it is the only portion of earlier masonry to be integrated into the building fabric of church E. The earlier masonry, which has extensive counterparts

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[19] H. Detweiler, *Bulletin of the American Schools of Oriental Studies* 174 (1964) 17f.; the plan shown in Fig. 8 is incorrect with respect to the timbers in that they are shown continuing under the floor of those areas without foundation walls.

in the remains of the earlier church is different from the masonry of church E above all because of its lack of mortar. It does not continue through the whole thickness of the wall, for the exterior surface of this portion of the south wall is faced with masonry which cannot be distinguished from that of other comparable walls of the church.

When the pit was excavated in 1963 the soil and debris near its floor were moist, leading the excavators to believe that it had been built with waterproof cement and that it must, therefore, have been a baptistery[20]. However, further investigation in 1972 showed that the mortar used in the construction of the pit does not differ from that used elsewhere in the church while its composition differs markedly from that used in cisterns found in Sardis. Moreover, excavation underneath the floor of the pit revealed no drainage system, but rather, two graves at a level about 80 cm below the floor of the pit. The grave closest to the center of the pit, which was only about 1 m long, contained the skeleton of an adult not in a stretched out position like all of the other numerous graves found near church E. Rather, the bones had been placed in a pile with the skull, together with a small glass vessel, in the center[21]. Even though the evidence is circumstantial, the small size of the grave, considering that it was the grave of an adult, and the unusual position of the bones and skull implies that the grave constitutes a reburial, and this observation as well as the inclusion of a glass vessel, equally unusual in Sardis graves, further indicate that the grave was that of a particularly important or venerated person, perhaps a saint. On the other hand, in spite of the possible interpretation of the grave as a reburial it seems to have occupied its present position already during the medieval reconstruction of church EA, for otherwise there would have been no apparent point to preserving the earlier masonry and fresco in the south wall of the pit. Indeed, the purpose of the pit could well have been the preservation and the veneration of a holy image, related to the grave, which had been painted on the south wall of the medieval reconstruction of church EA[22].

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[20] Ibid. 17.

[21] Ibid. 211 (1973) 7f.; G. M. A. HANFMANN, ibid. 215 (1974) 33ff. and Fig. 6; idem, Excavations and Restoration at Sardis 1972. *Türk Tarih Kurumu Basimevi*, Ankara 1975, 60 and particularly Fig. 5; the glass vessel has been tentatively attributed to the second half of the fourth or the fifth century by A. VON SALDERN, who will publish the glass found at Sardis in the series Archaeological Exploration of Sardis.

[22] G. M. A. HANFMANN, *Bulletin* 215, 37 proposes that both graves were already in their present positions when church EA was constructed in the 4th or 5th centuries, because they are located lower than the floor of church EA, because a coin probably dating from the 4th century was found above the graves, and because of the date of the glass vase. This appealing suggestion would be entirely convincing if the location of the graves bore a stronger relationship to the architectural features of church EA. Ideally

II. Chronology

Due to the absence of historical or archaeological evidence useful for dating church E we are dependent upon a stylistic analysis of the building to establish the period of its construction. The aspects which will be most useful for this purpose are the plan, together with its vaulting system, and the brick ornamentation of the facades. Only after we have established the general stylistic context of the church will it be possible to draw more specific conclusions concerning the date of its construction with the aid of historical and archaeological evidence.

1. Plan and Vaulting System

The inscribed cross church with five domes, the four smaller domes placed more or less diagonally with respect to the major dome, occurs in relatively few examples when considered in the broad context of Middle and Late Byzantine architecture. It is therefore surprising that the extant examples are distributed over a very wide area including Greece, Yugoslavia, Bulgaria, Calabria, and Russia, and that their construction spans the period between the 10th and 15th centuries[23]. Church E in Sardis is the first church of this type to be discovered in Asia Minor.

The origin of the five domed inscribed cross church type has as yet to be clarified. It is generally assumed that the first church to be built with these attributes was the so-called Nea Ekklesia in Constantinople, consecrated in 880 and known only from brief descriptions[24]. However, the frequently cited

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the grave of a saint who was venerated in the church would occupy an important position, for instance in the apse, on the major axis of the nave, in a separate chapel or martyrion, or even along one of the walls. Conceivably there was some special reason which can no longer be ascertained for placing the graves in an eccentric position. On the other hand, it is also possible that the graves were given their present positions during the medieval reconstruction of church EA, when certain parts of the older building may have been abandoned.

[23] Churches which may nominally be described as five domed inscribed cross churches continued to be built in Russia until this century. However, only the earliest Russian examples are relevant in a discussion of byzantine architectural forms, and even these are in some ways too specifically Russian or too uncertain with respect to their original forms to be useful in the present context.

[24] For instance R. Krautheimer, Early Christian and Byzantine Architecture (2nd ed., revised). Harmondsworth 1975, 376f.; O. Wulff, Altchristliche und Byzantinische Kunst 2. Berlin 1914, 454, among many others. R. J. H. Jenkins and C. A. Mango, The Date and Significance of the 10th Homily of Photius. *DOP* 9—10 (1955—56) 125ff. for the consecration of the Nea, with further references.

description in Photius' 10th Homily has recently been shown to refer to another church[25] and the brief description given by Constantine Porphyrogenitus is at best ambiguous, for "... a ceiling ... composed of five domes ..."[26] would better describe a church with five domes built on a cruciform plan similar to the Church of the Holy Apostles in Constantinople or the 9th century church of St. Andrew in Peristerai[27], in which the five domes are the most prominent features of the interior as well as the exterior. In five domed inscribed cross churches, on the other hand, the corner domes are barely visible from the central parts of the church because they are usually hidden from view by the corner columns and lower arches. Moreover, if the Nea had been built as a five domed inscribed cross church it is surprising that no other example of this church type remains in Constantinople even though numerous inscribed cross churches without corner domes, which were built in the following decades and centuries have survived there[28]. While this argument is admittedly inconclusive, it is supported by the observation that the domed roof chapels of the Fenarî İsa Camii (Theotokos Church of Constantine Lips), built about 30 years after the Nea[29], can probably best be interpreted as a preliminary or transitional solution in which the corner domes were not yet fully integrated with the interior space of the church. The roof chapels of the Fenarî İsa Camii appear, in turn, to have been developed from the corner rooms (chapels?) located in similar positions over the corner vaults of the naos, between the major barrel vaults, for instance in St. Sophia in Salonica, probably built between 780 and 787[30]. Indeed, the use of roof chapels similar

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[25] Ibid.

[26] J. P. Richter, Quellen der byzantinischen Kunstgeschichte. Vienna 1897, 352ff.

[27] A. K. Orlandos, *ABME* 1951, 146ff.

[28] J. Kollwitz, Zur frühmittelalterlichen Baukunst Konstantinopels. *Römische Quartalschrift* 42 (1934) fn 38 makes this observation and also comments upon the discrepancy in the descriptions of Photius and Constantine Porphyrogenitus which was finally clarified by Jenkins and Mango.

[29] A. H. S. Megaw, The Original Form of the Theotokos Church of Constantine Lips. *DOP* 18 (1964) particularly 292f.

[30] H. Buchwald, The Church of the Archangels, fn. 188 with further references for the corner rooms in St. Sophia, and p. 43 for the date of the church; C. Mango, Architettura bizantina. Venice 1974, 161ff. believes that the church could well have been built to commemorate the victory against the Slavs in 783, an appealing suggestion which has not been verified. E. B. Smith, The Dome. Princeton 1950, 36 and 152ff. brings examples from Syria, Israel and North Africa of the 5th and 6th centuries with recorded or reconstructed domed rooms or tower-like structures at the gallery level flanking the bema, the western entrance, or both, and presents the tempting but tenuous suggestion that these spaces were chapels or oratories, and that they may have had an influence on Middle Byzantine churches with corner domes.

to those of the Fenarî İsa Camii in the Kalenderhane Camii at the end of the 12th century[31] implies that this transitional use of the corner domes was never abandoned in the capital, and that they were used there only when roof chapels were deemed appropriate. On the other hand, the fact that all of the earliest extant examples of the fully developed five domed inscribed cross church type are found in outlying and remote provinces of the empire[32] makes it possible to interpret the origin of the type as a provincial simplification and perhaps even misinterpretation of the Constantinopolitan roof chapel solution.

For the purpose of establishing the place of church E in Sardis within the development of the five domed inscribed cross church type it will be useful to broadly classify the extant examples into three distinct groups[33], without attempting to resolve the many problems of chronology and development surrounding many of the churches.

The first group is characterized above all by the location of the minor domes over the corner bays of the naos closest the major dome, and by the abbreviation or omission[34] of the narthex or of the bay between the apse and the eastern major supporting arch, or of both. The only churches in this group which can be dated with reasonable certainty are the church of the Virgin Cosmosoteira in Ferrae (formerly Vira or Ferejik), probably founded in 1152[35], and the church of St. Panteleimon in Nerezi outside Skopje, built before

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[31] H. Buchwald, ibid., fn. 188 with further references; I am grateful to Prof. Y. D. Kuban and Miss A. Sabuncu, who generously helped me with my research and permitted me to visit the church during the winter of 1973. While the recent restorations have confirmed that domed rooms, probably chapels, occupied positions over the four corner spaces of the naos, it was not possible for me to enter them to determine their specific forms. All four rooms have, apparently, been rebuilt with pendentive domes. Hopefully this valuable material will soon be published. C. L. Striker and Y. D. Kuban, Work at Kalenderhane Camii in Istanbul: Third and Fourth Preliminary Reports. *DOP* 25 (1971) 258 for the late 12th century date of the major parts of the church.

[32] See below.

[33] A. K. Orlandos, Ἡ Παντάνασσα τῆς Μονεμβασίας. *ABME* 1935, 144ff. first collected and organized most of the material presented here. The groups suggested below are formulated with the specific purpose of establishing the date of church E, and many characteristics which have no bearing on this issue are therefore ignored in their formulation.

[34] These two terms are used descriptively and without the implication that forms which were more complete necessarily preceded their use here.

[35] A. K. Orlandos, Τὰ βυζαντινὰ μνημεῖα τῆς Βήρας. *Θρακικά* 4 (1933) 3—32; T. Uspenskij, Konstantinopol'skij Saraljskij Kodeks Vos'miknizija. *IRAIK* 12 (1907) 1ff.; while the correctness of the date depends upon the correct identification of the church, numerous stylistic criteria support the proposed date.

1164[36]. The other churches in this group include San Marco in Rossano[37] and the so-called Cattolica in Stilo[38], both in Calabria, the Palaea Episkopi in Nikli on the Peloponessus[39], and the church of the Virgin Pantanassa south west of Monemvasia[40]. While none of these churches can be dated with any degree of certainty, it will be sufficient in our context to point out that all may reasonably be dated to the period between the late 10th and the early 13th centuries.

In the second group of inscribed cross churches with five domes the corner domes are not located over the corner bays adjacent to the major dome, as they are in the first group, but are located over more distant features of the building, such as the corner bays of an ambulatory, of the narthex, or of the side aisles. This solution spacially separates the corner domes from the central dome, adding a strong element of tension to the mass of the building on the exterior. The earliest known church with four small domes over the corner bays of an ambulatory is the Parigoritissa in Arta, built between 1283 and 1296[41], which does not, strictly speaking, belong into our group since it is

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[36] V. Petković, Pregled crkvenih spomenika kroz povisnica srpskog. Belgrade 1950, 210f., 937; N. Mavrodinov, Ednokorabnata i krbstovidnata crkva. Sofia 1931, 66—68; V. Ivanova, *Godišnik Naroden Muzei Sofia* (1925—6) 430ff.; G. Millet, L'ancien art serbe. Paris 1919.

[37] H. Theodoru, Les églises à cinq coupoles en Calabre: S. Marco de Rossano et la Cattolica di Stilo. *Ephemeris Dacoromana* 4 (1930) 149—180; P. Orsi, Le chiese basiliane della Calabria. Florence 1929, 9ff. and 33ff.; A. Venditti, Architettura bizantina nell'Italia meridionale. Naples 1967, 852ff.; P. Lojacono, L'architettura bizantina in Calabria e Sicilia. *SBN* 6 (1940) (Atti del V Congresso internazionale di studi bizantini, 1936) 2, 183ff.

[38] Fn. 37 and G. Dimitrokallis, Il problema della datazione della Cattolica di Stilo. *Archivio storico per la Calabria e la Lucania* 35 (1967) 31ff., who suggests a date in the second half of the 12th or early 13th century. A. H. S. Megaw, Byzantine Reticulate Revetments, in: Χαριστήριον εἰς A. K. Ὀρλάνδον III. Athens 1964, 18f. suggests a 10th century date for both churches on stylistic grounds which I find reasonable with the reservation that the churches could also have been built in the first half of the 11th century, given the lack of well dated material and the possibility that Calabrian workmen were not entirely up to date.

[39] A. K. Orlandos, Χριστιανικὰ μνημεῖα Τεγέας-Νυκλιοῦ. *ABME* 1973, 129ff., convincingly dates the building to the late 10th or the first half of the 11th centuries; the plan reproduced in Fig. 99 supersedes that reproduced in idem, Ἡ Παντάνασσα, Fig. 7.

[40] Ibid. 139ff., convincingly dates the building to the late 12th century. A possible objection to this date because of the 13th century date frequently accepted for St. Sophia in Monemvasia, which has numerous similar architectural details, is now no longer relevant. As was shown in a paper presented by E. Kalligas at the 15th International Congress of Byzantine Studies in Athens, September 1976, the church now known as St. Sophia cannot be associated with the 13th century church of that name.

[41] A. K. Orlandos, Ἡ Παρηγορίτισσα τῆς Ἄρτης. Athens 1963.

not an inscribed cross church. The most important examples of the following decades include the churches of St. Catherine[42] and of the Holy Apostles[43] in Salonica, the church of the Virgin Ljeviska in Prizren[44], the church of St. George in Staro Nagoricino[45], and, perhaps architecturally the most accomplished, the church of the Koimesis in Gracanica[46]. It is important to observe that, while the first group ends in the early 13th century, the second group begins in the late 13th century, indicating that the second group of churches represents a Late Byzantine continuation and further development of the earlier Middle Byzantine series.

The same may be said of the much smaller third group of inscribed cross churches with five domes, to which church E in Sardis must be counted. Although all of the churches in this group known until now are datable to the Paleologue period, they are old fashioned in that the minor domes are located over the corner bays immediately adjacent the major dome. In this respect they are closely related to our first group of churches. They differ from the earlier group however, in that they were built with a full narthex covered with a dome or pendentive dome on the major axis, and with a spacious bay between the apse and the eastern cross arm, flanked by pendentive domes over the eastern bays of the side aisles. The extant churches of this group are the church of the Virgin Hodegetria in the Brontochion Monastery in Mistra (Afentico), built in the first decade of the 14th century[47], the church of St. Demetrius (Metropolis) in Mistra, probably rebuilt in its present form

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[42] C. Diehl—M. Le Tourneau—H. Saladin, Les monuments chretiens de Salonique. Paris 1918, 179—186; the church is often assigned to the late 13th century in recent literature, for instance R. Krautheimer, ibid., 454f., but a somewhat later date is suggested in H. Hallensleben, (review of) R. Krautheimer, Early Christian and Byzantine Architecture, *BZ* 66 (1973) 130f.

[43] C. Diehl, ibid. 189—200; V. Laurent, *REB* 7 (1949) 149; the church is dated 1312—15 with all probability.

[44] N. Nenadović, Bogorodica Ljeviska. Belgrade 1963; the church was rebuilt with corner domes over the outer bays of the side aisles 1306—7.

[45] Millet, ibid. 97—101; M. G. Bosković, Deux églises de Milutin: Staro Nagoričino et Gračanica, in: L'art byzantin chez les slaves. Paris 1930, 195ff.; the church was rebuilt with corner domes over the outer bays of the side aisles in 1312—1313.

[46] G. Millet, ibid. 102—107; M. G. Bosković, ibid. 206—212; the church was constructed 1318—1321.

[47] H. Hallensleben, Untersuchung zur Genesis und Typologie des "Mistratypus". *Marburger Jahrbuch für Kunstgeschichte* 18 (1966) 105ff.; M. Chatzidakis, Μυστρᾶς. Athens 1948, 55ff.; G. Millet, Monuments byzantins de Mistra. Paris 1910, 23ff.; S. Dufrenne, Les programmes iconographiques des églises byzantines de Mistra. Paris 1970, 8ff. for a thorough summary of the issues involved in the dating of the church and a repudiation of the attempt to date the church to "about 1308".

in the early 15th century[48], the church of the Virgin Pantanassa in Mistra, dedicated 1428[49], and the church of St. John Aleiturgitus in Nessebar (Mesembria), attributed to the late 13th or first half of the 14th century[50].

The plan and vaulting system in each of these churches, including Sardis, is strikingly similar and even the proportional scheme used in Sardis, the *quadratura*, is used in exactly the same manner in all the churches of this group with the exception of St. Demetrius in Mistra, which was rebuilt on earlier walls[51]. The basilical emphasis of the plan of church E is also common to the Mistra group, even though it is achieved there in a somewhat different manner[52]. For the most part the differences within the group are limited to relatively minor details, such as the lack of windows and of a full drum on the interior of the corner domes of both Sardis and Nessebar[53], the use of a groined vault or pendentive dome over the bema bay at Nessebar[54], the open arcade between the flanking chapels and the bema in Sardis, and the use of

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[48] M. Chatzidakis, ibid. 34ff.; G. Millet, ibid. 16ff.; S. Dufrenne, ibid. 5ff.; M. I. Manoussakas, Ἡ χρονολογία τῆς κτητορικῆς ἐπιγραφῆς τοῦ Ἁγίου Δημητρίου τοῦ Μιστρᾶ. *DChAE* 1 (1959) 72—79.

[49] M. Chatzidakis, ibid. 85ff.; G. Millet, ibid. 35ff.; S. Dufrenne, ibid. 9ff.

[50] A. Rachenov, Eglises de Mesembria. Sofia 1932, 36ff. The minor domes on the diagonal axes of the major dome had no drums on the interior, but were full domes on pendentives (not pendentive domes).

[51] The geometric construction was established on the basis of the best available published plans, admittedly a hazardous method when one considers the inaccuracies of byzantine construction and the inaccuracies of many modern plans. However, in the great number of church plans which were examined either the quadratura fit immediately into place or did not fit at all. The underlying square is not limited to the plan, but was also used to establish the basic measurements of the cross section. In all of the churches the width of the naos is equal to its height, measured to the major string course under the dome.

[52] The basilical solution in Mistra is due at least in part to the need to provide support for the galleries, as is pointed out by H. Hallensleben, ibid. 109ff. The only inscribed cross church with columns rather than walls between the bema and the flanking chapels known to me, aside from Sardis, is the church of Sts. Peter and Paul in Tirnovo, which has been dated to the first half of the 14th century by N. Mavrodinov, Ednokorabnata, 96ff.

[53] Rachenov, ibid. 40ff.; not enough of the upper portions of the corner domes is extant to be certain that they did not have low cylindrical drums like those of Sardis on the exterior; although these domes are described as spherical in the report they appear to me to have been elliptical in profile like those of Sardis. The reconstruction proposed in Fig. 27 is not convincing because the minor domes and probably even the pendentive domes at the eastern ends of the side aisles must have protruded to a certain extent, even if they had no drums on the exterior.

[54] Ibid. 39f.; the extant masonry, which is minimal, could as well be interpreted to be the lowest portion of a groined vault; only in the narthex are the remains sufficient to be certain of the form of the vault, which was a pendentive dome.

exedral niches in the lateral walls of the flanking chapels in the Hodegetreia and the Pantanassa[55]. The only major difference between the churches of this group lies in the fact that only the churches of Mistra have galleries. This difference is, however, undoubtedly to be explained by functional and iconographic considerations, for the galleries at Mistra appear to owe their origin to the court ceremonial of the Despots of Mistra, and such galleries would therefore have served no function in Sardis or Nessebar[56].

The plan and vaulting system of church E at Sardis therefore have their closest parallels neither in the early group of five domed inscribed cross churches, nor in the rich late series of northern Greece and Serbia, but in a small sub-group built in the ripe Paleologue period.

2. Brick Ornamentation

An investigation of the brick ornamentation which was so richly used to decorate the facades of church E leads to a similar conclusion. While a comprehensive analysis of the brick ornamentation used in Byzantine architecture does not exist and would, indeed, go far beyond the purpose of the present investigation, a number of observations concerning its use, based upon the still inadequate published material available will nevertheless be useful for determining the date of church E.

The brick meander found near the tops of the domes in church E is by far the most common motif used in Sardis, and the motif with the most complex development. To my knowledge the earliest example of a brick meander pattern now known in a Middle Byzantine facade is that found in the upper spandrels of the eastern facade of the Katholikon of Hosios Lukas, probably built in the first quarter of the 11th century[57]. While the motif as it is used here is geometrically quite simple, it is rhythmically complex in

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[55] G. Millet, Monuments, Pl. 23 and 35.

[56] C. Delvoye, Considérations sur l'emploi des tribunes dans l'église de la Vierge Hodigitria de Mistra, in: Actes du XII[e] Congr. Int. d'Ét. Byz. Ochride 1961, 3. Belgrade 1964, 41—47; the objections raised by Dufrenne, ibid. 9 and Mango, Architettura, 356 fn. 28 have no influence on the validity of D's basic argument concerning the reasons for the use of galleries at Mistra.

[57] R. W. Schultz and S. H. Barnsley, The Monastery of S. Luke of Stiris, in Phocis. London 1901, Pl. 9; A. H. S. Megaw, The Chronology of Some Middle Byzantine Churches. *Annual of the British School at Athens* 32 (1931—1932) 117f., for the meander frieze, and M. Chatzidakis, A propos de la date et du fondateur de Saint-Luc. *Cahiers Archeologiques* 19 (1969) 127ff., and E. Stikas, Τὸ οἰκοδομικὸν χρονικὸν τῆς μονῆς Ὁσίου Λουκᾶ Φωκίδος. Athens 1970, for the date. The late date suggested by Stikas (1042—55) would make the isolated instance of the meander here, several decades before it appears elsewhere more plausible.

that it has a definite directional movement from left to right, and in this respect it recalls not only the Greek fret of Antiquity but also Middle Byzantine examples in Constantinople. Here the simplest and probably the earliest is found on the south facade of the Eski Imaret Camii, which may have been built in the late 11th century[58]. Another, somewhat richer meander is found, in extremely fragmentary condition at the top of the eastern facade of the Kariye Camii in an area which must be assigned to the late 11th or to the first half of the 12th centuries[59]; its position indicates that it was originally a most prominent feature of the facade decoration. Finally, a still more complex, and more impressive, more extensive meander frieze exists at the top of a portion of the sea wall facing the Marmara which may, perhaps, have been part of the church of Christ Philanthropos, built in the early 12th century[60]. All three of these examples are closely associated with masonry of similar character which includes recessed brickwork typical of the 11th and 12th centuries, and they cannot, therefore, be assigned to later restorations[61].

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[58] A. Van Millingen, Byzantine Churches in Constantinople. London 1912, 212ff.; J. Ebersolt and A. Thiers, Les églises de Constantinople. Paris 1913, 171ff.; T. Mathews, The Byzantine Churches of Istanbul. University Park—London 1976, 59ff., Fig. 9—5; also A. Pasadaios, Ὁ κεραμοπλαστικὸς διάκοσμος τῶν βυζαντινῶν κτιρίων τῆς Κωνσταντινουπόλεως. Athens 1973, 5ff. and Pl. 1, 25/g, 45/a, with an exemplary collection of brick masonry ornamentation in Constantinople. The almost exact coincidence of almost every feature of the naos of this church with that of the north church of the Fenarî Isa Camii, including minute details of the vaulting, makes it difficult to believe that almost two centuries lie between their construction.

[59] Fig. 17. — To my knowledge this detail has not been published. P. A. Underwood, The Kariye Djami. New York 1966, 8ff.; D. Oates, A Summary Report on the Excavations of the Byzantine Institute in the Kariye Camii 1957 and 1958. *DOP* 14 (1960) for the construction dates.

[60] Fig. 18. — R. Demangel and E. Mamboury, Le quartier des Manganes et la première région de Constantinople. Paris 1939, 51ff.; K. Wulzinger, Byzantinische Baudenkmäler zu Konstantinopel. Hannover 1925, 4ff.; Pasadaios, ibid. 7ff., pl. 25/a, 45/d, 46/a. Neither the style of the architectural features nor the form of the masonry (fn. 61) contradict the proposed dates, as far as may be judged under present conditions. See also A. M. Schneider, Byzanz. Berlin 1936, 74f.

[61] Recessed brickwork as a criteria for dating 11th and 12th century buildings was first suggested by N. Brunov, Die Odalar-Djami von Konstantinopel. *BZ* 26 (1926) 360f.; the most recent summary of the material is given by H. Schäfer, Architekturhistorische Beziehungen zwischen Byzanz und der Kiever Rus im 10. und 11. Jahrhundert. *Istanbuler Mitteilungen* 23—24 (1973—1974) 197ff. The masonry of the sea wall underneath the meander frieze is the same in character as that of the nave and lower apse walls of the Kariye Camii, both consisting of bands of brick which alternate with bands of three courses of ashlar, whereby a single brick course is located between each of the stone courses. In the Eski Imaret Camii, on the other hand, the recessed brick masonry alternates with between one and three, but usually two courses of ashlar which only occasionally and only in the lower portions of the walls have single courses of brick bet-

Also, all three are carried out in a technique reminiscent of "niello" ornamentation in which the brick pattern is clearly legible against a broad background of mortar, in contrast to most examples from the provinces, in which the brick and mortar areas are so nearly equal that an intensely rhythmic figure-ground relationship is created in which the brick pattern and its background are visually interchangeable, making the pattern almost illegible.

The existance of rich and extensive examples of the brick meander in prominent positions on important facades in Constantinople no later than the late 11th and early 12th centuries leads to the conclusion that the application of similar but simpler motifs in the Byzantine provinces in the 11th and 12th centuries is ultimately dependent upon Constantinopolitan prototypes. The rich examples from the capital can certainly not be derived from the far simpler provincial forms and must have been directly imitated from either Classical or Early Byzantine motifs in other media. While the simpler motifs used in the provinces could have been simplifications, created either in the provinces or in the capital, of the extant Constantinopolitan motifs, they could also at least in part represent imitations of simpler Classical motifs which may originally also have been used in Constantinople in the 11th and 12th centuries.

While unfortunately not a single extant monument which may be dated to the period between the middle of the 10th and the third quarter of the 11th century with reasonable certainty is now known in Constantinople and brick ornamentation can therefore not be traced there during that period, the lacuna is partially filled by examples of meander bands in Russian churches which seem to have been built under the direct influence of Constantinople. The same complex meander found in the sea wall was also used, for instance, if not with complete understanding, in the Cathedral of the Transfiguration in Chernigov, begun around 1036, together with masonry surprisingly similar to that of the Eski Imaret Camii[62]. Somewhat later, probably in the early 12th century, a simpler non-directional meander, the most common form of the meander frieze in the Byzantine provinces, was used in the church of the Saviour of Berestovo in Kiev[63], an indication that this form of the meander frieze was probably current in contemporary Constantinople.

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ween the courses of stone. This form appears to be somewhat earlier, for it still retains more of the character of the alternating bands of brick and ashlar found in the 10th century, for instance in the Fenarî Isa Camii.

[62] G. N. Logwin, Chernigov, Novgorod-Sewerski, Gluchow, Putiwl. Moscow 1965; M. Makarenko, The Cathedral of the Transfiguration in Chernigov (Russian). Kiev 1929; H. Faensen and W. Iwanow, Altrussische Baukunst. Vienna—Munich 1972, fig. 40.

[63] M. Karger, On the History of the Architecture of Kiev in the late 11th and early 12th Century; the Church of the Saviour in Berestovo. *Soviet Archaeology* 17 (1953) 223—247 (Russian); Faensen—Iwanow, ibid. fig. 37.

The earliest extensive use of this form of the meander frieze in a reasonably well dated building occurs in the church of Daphni, probably built in the last quarter of the 11th century[64]. Here the vibrant and intense rhythm typical of most Greek examples and of the examples found in Sardis, but not of those in Constantinople and in Russia, is already present. Other early examples include those of the Hagia Moni in the Argolis, built between 1143 and 1149[65], the nearby church of the Panagia in Merbaka, dated stylistically to the third quarter of the 12th century[66], Hagia Varvara in Eremos in Mani, dated stylistically to the second half of the 12th century[67], and the Panagia Krina on Chios, probably built in the latter part of the 12th century[68]. A fragmentary example is also found in Hagios Soter in Gardenitza in Mani, attributed to the second quarter of the 11th century on stylistic grounds[69]. The use of the meander frieze in most of these churches in positions reminiscent of the Constantinopolitan examples, particularly the Kariye Camii, underscores their dependence upon examples from the capital.

Important for a more precise dating of the Sardis meander is the observation that the non-directional form of the meander frieze found at Daphni underwent various transformations in the course of the 12th century, on the one hand in the direction of even simpler meander bands, and on the other hand in the direction of greater complexity achieved, not as in Constantinople by the addition of more complex directional units, but by the repetition of the non-directional meander band. These transformations, which do not occur in Constantinople and do not seem to depend upon Classical prototypes were, perhaps, the products of local workshops, presumably in the area of present Greece, where for the most part they are first found.

For instance, while the examples listed above are composed of two separate interlocking strands one of which is open at the top and the other at

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[64] G. MILLET, Daphni. Paris 1899, Fig. 27; MEGAW, The Chronology, 93f., 117.

[65] MEGAW, ibid. 94, 97, 117f., pl. 28; A. STRUCK, Vier byzantinische Kirchen der Argolis. *Mitt. d. Kais. Deutschen Arch. Inst., Athen. Abt.* 34 (1909) 189, fig. 4.

[66] MEGAW, ibid. 94f., 117f. and passim; STRUCK, ibid. pl. 6, 10. Also A. BON, Monuments d'art byzantin, in ΧΑΡΙΣΤΗΡΙΟΝ, 92f.

[67] A. H. S. MEGAW, Byzantine Architecture in Mani. *Annual of the British School at Athens* 33 (1932—33) 145ff., pl. 17.

[68] C. BOURAS, Chios. Athens 1974, fig. p. 22, 30ff., points out that recessed brickwork typical of the 11th and 12th centuries is used in the church; IDEM, Die Insel Chios, in: Alte Kirchen und Klöster Griechenlands, E. MELAS ed., Cologne 1972, 250, fig. 110, suggests a 12th or 13th century date.

[69] MEGAW, ibid. 147, 154ff., pl. 20; the form of the meander is not distinct in the reproduction and in view of the early date assigned to the church and its relatively obscure location, I hesitate to suggest that this, rather than Daphni provides the earliest example now known in Greece.

the bottom, the Sardis meander is formed of only a single strand open alternately at the top and bottom. The earliest example of this simpler form in a dated building occurs in a short section on the apse of the Hagia Moni in the Argolis, below the much more extensively used meander composed of two strands[70]. Other examples are found on the apse of the Palaea Metropolis in Verroia in northern Greece, which seems to have been built in the 12th century[71] on the Catholicon of Gastoune in Elis, dated stylistically to the third quarter of the 12th century[72], and on the dome of the Church of the Archangels in Batchkovo, Bulgaria, probably built in the late 12th century[73].

Although the meander with two strands was revived and used extensively, together with more complex meander forms in Constantinople[74] and elsewhere in the Paleologue period[75], the meander with a single strand as it was used in Sardis cannot, to my knowledge, be demonstrated during this period except for examples in western Asia Minor which were probably built in the 13th century. In the largest church on Kaiwe Assar Adassi in the Bafa Göl near ancient Heracleia the meander form is similar to that of Sardis (Fig. 19, 20)[76], while that on the apse of the church of the Prophet Naum in Aleshehir

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[70] Fn. 65.

[71] G. A. Soteriou, Βυζαντιναὶ βασιλικαὶ Μακεδονίας καὶ παλαιᾶς Ἑλλάδος. *BZ* 30 (1929—30) 568ff., fig. 2. The frieze of triangles used above the meander is also found in the Gül Camii in Constantinople and in Chilandari; the earliest frescoes in the church have been attributed to the 12th century.

[72] Megaw, The Chronology, passim, 118, pl. 29.

[73] N. Mavrodinov, Ednokorabnata, 49, fig. 62; the assigned date is uncertain.

[74] In the south church of the Fenarî Isa Camii, built late in the 13th century. Pasadaios, Ὁ κεραμοπλαστικὸς διάκοσμος 12ff., pl. A, 5, 25; T. Macridy, The Monastery of Lips and the Burials of the Palaeologi, *DOP* 18 (1964) 253ff.; the meander was not used again in the later extant Constantinopolitan churches, but appears in a drawing of the Sinan Pasha Mescidi published by Paspates and reproduced in T. Mathews, The Byzantine, fig. 30—1, who relates the church to the south church of the Fenarî Isa Camii.

[75] I have noted the following examples, aside from those in the text below: Porta Panagia in Thessaly, built 1283 (A. K. Orlandos, *ABME* 1935, 5ff.); Bogorodica Ljeviska in Prizren, rebuilt 1307 (fn. 44); Staro Nagoričino, rebuilt 1313 (fn. 45); St. George in Omorphokklesia, probably built 1317 (D. M. Nicol, Two Churches of Western Macedonia. *BZ* 49 (1956) 96ff.; E. Stikas, Une église des Paléologues aux environs de Castoria. *BZ* 51 (1958) 100ff.); Spasovica, built 1330 (G. Millet, L'ancien art, 111f. fig. 114; Zaum, built 1361 (A. Deroko, Architecture in Medieval Serbia. Belgrade 1953 [Serbian], 183, Fig. 294). While this list is incomplete it demonstrates that the use of this form of the motif was limited to provincial examples after the Early Paleologue period.

[76] T. Wiegand, Der Latmos. Berlin 1913, 42ff.; the reconstruction in fig. 66 is incorrect in that it fails to show the clerestory walls and because there is no reason whatsoever for the proposed reconstruction of the dome or upper narthex.

(Philadelphia)[77] and on the northwestern tower of the upper citadel of Manisa (Fig. 21)[78] is somewhat simpler. Similar simplifications, in which the meander was transformed into a highly stylized, rhetorically used frieze of vertical bricks bordered on the top and bottom by horizontal brick courses are also found in the Panagia tou Brioni near Arta, built 1238[79], and in a qualitatively superior form at Gracanica[80] and on the Parecclesion in Stip[81]. Even simpler, barely "legible" forms in which the underlying meander motif is all but lost apparently represent the ultimate stage in the disintegration of the meander. Examples are found in the church of the Blachernae monastery, attributed to the first half of the 13th century, and in the Kato Panagia, built between 1231 and 1271, both near Arta[82].

Increasing complexity achieved by repetition goes hand in hand, at times in the same building, with the simplification described above. An unusual early example of this process is found in Hagios Nikolaos in Ochia in Mani, dated stylistically to the second quarter of the 12th century, where the typical meander frieze is composed of three rather than the usual two strands[83]. Far more common, however, is the repetition of one meander band above the other, as it first occurs in a limited fashion in Hagia Moni and, somewhat more extensively in Merbaka[84]. In the churches of Hagios Basileios and Hagios Nikolaos tis Rhodias in Arta, both of which are attributed to the 13th century, the meander is repeated two and three times and, in contrast to the earlier examples, each meander band is equal in height[85]. Toward the end of the 13th century in the Parigoritissa in Arta the individual units of two adjacent meander bands are paired symmetrically, integrating both bands into a single frieze in which each double unit can be read as a crisply articulated cross[86]. The same motif occurs again, no longer as a frieze, but as a surface filling

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[77] G. LAMPAKIS, Χριστιανικὰ μνημεῖα, ἐρείπια καὶ συντρίμματα, ἑπτὰ ἀστέρες τῆς ἀποκαλύψεως. Athens 1906, 376ff., fig. 181.

[78] All of the walls of the upper citadel are uniform in construction, using building techniques similar to those used in Sardis E, and apparently belong to fortifications built during the Lascarid rule of the 13th century (A. HEISENBERG, Kaiser Johannes Batatzes der Barmherzige. *BZ* 14 (1905) 160—233).

[79] A. K. ORLANDOS, *ABME* 1936, 51ff., fig. 3, 4.

[80] Fn. 46.

[81] MILLET, L'ancien art, fig. 121; the Parecclesion has entirely disappeared (1972).

[82] A. K. ORLANDOS, *ABME* 1936, 3, fig. 6, 7, 12; G. MILLET, L'école grecque dans l'architecture byzantine. Paris 1916, fig. 121.

[83] MEGAW, Mani, 147, 162, and passim; R. TRAQUIAR, The Churches of Western Mani. *Annual of the British School at Athens* 15 (1908—9) 181f. and pl. 16.

[84] Fn. 65, 66; G. MILLET, ibid. fig. 118.

[85] A. K. ORLANDOS, *ABME* 1936, 115ff., fig. 3; IDEM 131ff., fig. 3, 4.

[86] Fn. 41, particularly fig. 22, 23.

pattern, in St. Clement in Ochrid, built 1294—95[87], in the Palaiokatounas church in Akarnania, Aetolia, dated stylistically to the end of the 13th or beginning of the 14th centuries[88], and in the churches of St. Catherine and of the Holy Apostles in Salonica[89], but not, to my knowledge, thereafter.

The double meander frieze found on one of the Sardis domes (Fig. 12 and p. 269 above) can be related to the development outlined above. While it is similar to the example in the Parigoritissa in that both bands are integrated into a single frieze, the frieze is not yet readable as a series of crosses and, like the 12th century examples in the Argolis, the two bands are not of equal size. The Sardis frieze must therefore be attributed to a stage of development between that of 12th century Argolis and late 13th century Arta. A double meander frieze very similar to that of Sardis E is found on the apse of the undated largest church on Kaiwe Assar Adassi, and this church must therefore have been built at about the same time by builders working in a similar provincial idiom (Fig. 19)[90].

The herringbone brickwork which decorates the lunettes of the blind arcade on the major apse of Sardis E has a very different course of development from that of the meander frieze. While the use of the meander apparently reflects 11th century retrospective tendencies long recognized, for instance, in the illumination of manuscripts and in ivory carving, the herringbone brick patterns probably have their origin in structural techniques which were being developed at least as early as the 3rd century. By dividing the surface of a vault into smaller structural units each of which was covered by a separate arched portion of masonry the use of expensive and time consuming centering could be reduced or eliminated[91]. The simplest and smallest unit into which the surface of a vault could be divided was that covered by two bricks which lean against each other in a triangular form, producing the simplest form of arch. The repetition of this form throughout the vault produces the typical herringbone brick pattern found in Sardis.

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[87] MILLET, ibid., 10; KRAUTHEIMER, Early Christian, fig. 383.

[88] A. K. ORLANDOS, *ABME* 1961, 21ff.

[89] Fn. 42, 43.

[90] WIEGAND, Latmos, fig. 64; the structural techniques used in this church are also very similar to those of Sardis E, but the church was probably built slightly later because its facade arches are constructed of cut stone voussoires which alternate with brick, a form not yet found in Sardis. This decorative feature is usually found later within the same city or province than arches built entirely of brick, although exceptions do exist, and although stone and brick arches may appear earlier in other, more distant provinces. In Constantinople stone does not yet appear in the arches of the Fenarî Isa Camii south church but is used frequently in later Paleologuan buildings (see also fn. 124).

[91] P. SANPAOLESI, Strutture a cupole autoportanti. *Palladio* 21 (1971) 3ff.

While early examples such as the Dogu Mausoleum U in Side, the mausoleum of Diocletian in Split, and the baptistery of the church of the Virgin in Ephesus[92] apparently include only full domes, similar techniques were responsible for the form of the brickwork in Middle Byzantine exedral vaults. Exedral vaults in the Fenarî İsa Camii north church, for instance, are built of brick courses laid neither radially nor in the usual concentric courses, but in parallel courses which slope down diagonally toward the center of the vault, thereby dividing the surface of the vault into smaller structural units[93]. Exedral vaults in the Bodrum Camii (Fig. 23)[94] and the Ahmet Paşa Camii, which must be dated to the 9th rather than to the 12th century (Fig. 24)[95], are built in a similar manner except that the direction of the brick courses is changed more frequently, dividing the vault surface into still smaller structural units and reducing the spans of the individual brick arches. A short next step in the development leads to vaults with brick courses in the shape of a W, a form which was frequently used in later Byzantine buildings alongside exedral vaults which continued to be built with concentric brick courses. With the application of such masonry techniques in small apsidal niches it is only one more short final step to the herringbone brick pattern.

The same structural short-cut used on the interior of the Fenarî İsa Camii north church was also used in exedral niches on its exterior, certainly without

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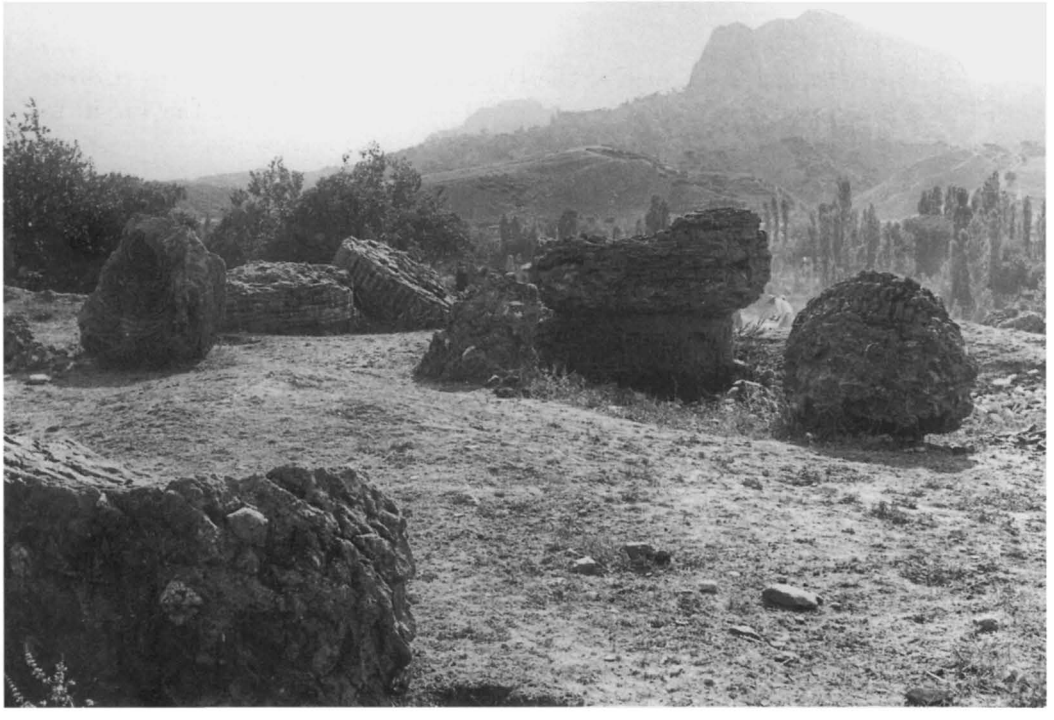
[92] Best illustrated in IDEM, passim, with further references.

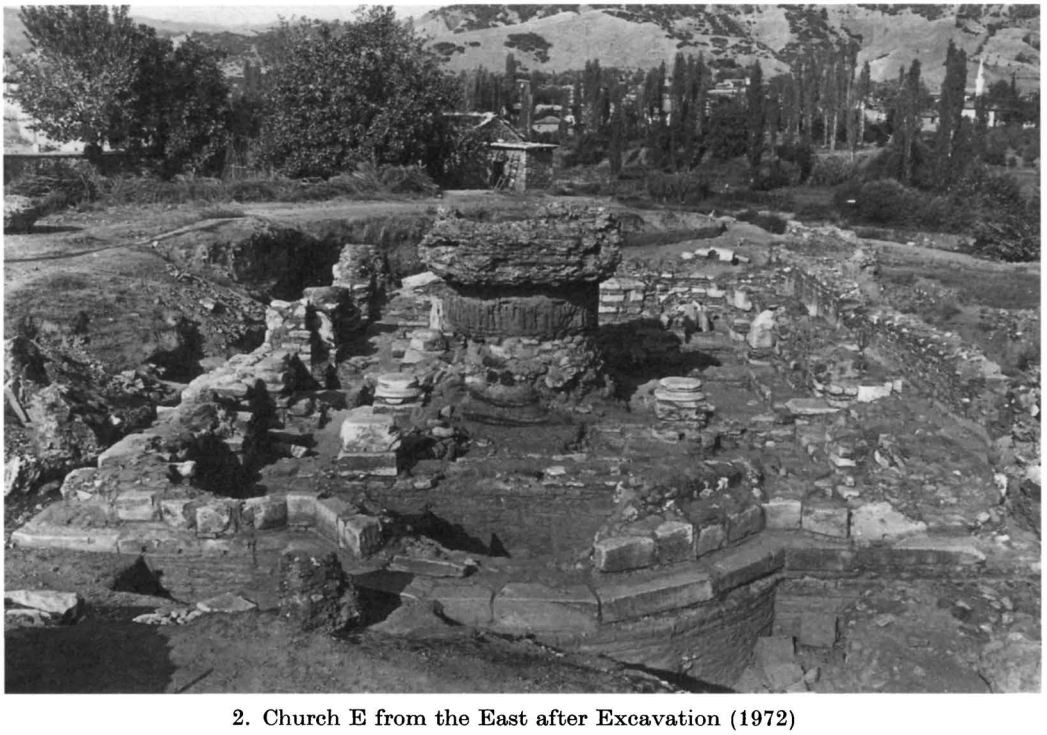
[93] T. MACRIDY, The Monastery, fig. 24, 26; the same vaulting form was used in the narthex and the flanking chapels, but not in the major apse.

[94] A. VAN MILLINGEN, Byzantine Churches, 196ff.; A. M. SCHNEIDER, Byzanz, 65 for further references. The photograph shown in fig. 24 was taken before the recent restorations. The development does not seem to have been very consistent.

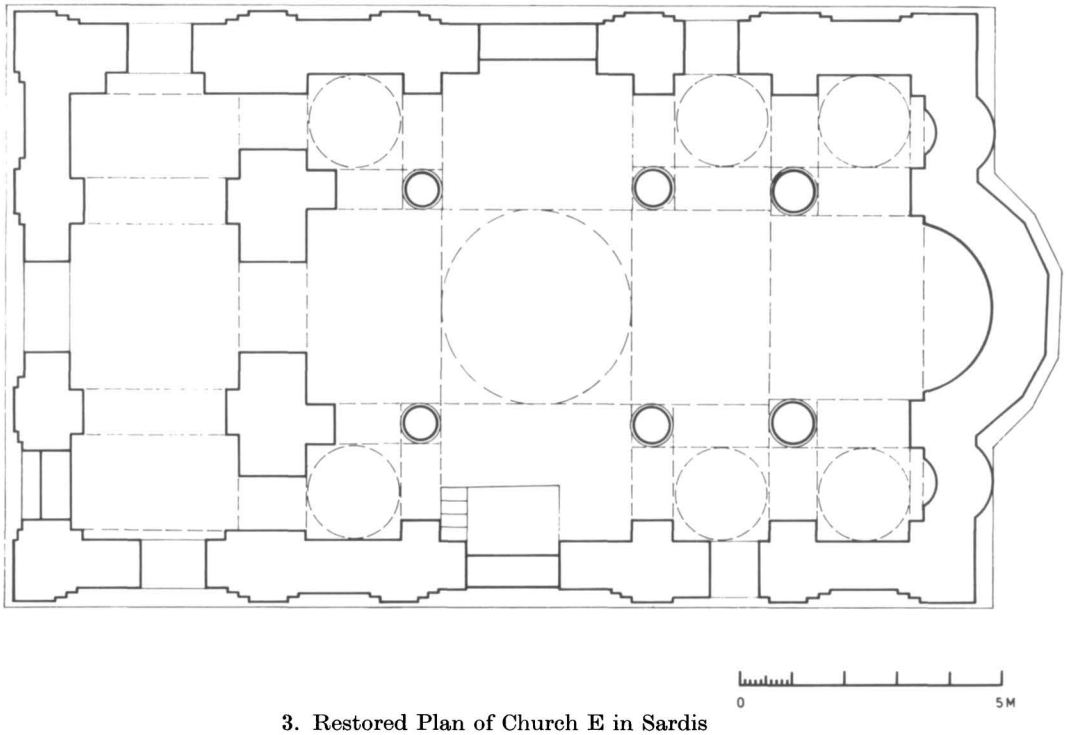
[95] The reasons for the generally accepted date given in VAN MILLINGEN, ibid. 201ff. and most recently summarized in MATHEWS, The Byzantine, 159ff. are inadequate. The following considerations lead to the conclusion that the church was probably built in the 9th century: 1. the circular, unadorned form of all three apses is used in 9th and 10th century churches in the Byzantine provinces and is found in the capital neither in the dated well known 10th century examples nor thereafter; 2. The same is true for the circular form of the drum, which must be earlier than that of the Bodrum Camii; the form of the dome windows and of the brick string course above the arches precludes that the dome belongs to a Turkish reconstruction; 3. the masonry used in the church, several courses of brick which alternate with several courses of ashlar, is typical of Constantinopolitan construction from the 8th to the 10th centuries and is used there in the Fenarî Isa Camii north church, but not in the 11th—12th C. (BUCHWALD, Sige 57f.); 4. recessed brickwork, the hallmark of Constantinopolitan masons in the 11th and 12th centuries is not found in the church; 5. the forms of the windows and the profiles of the facade arches are simpler and less developed than those used in the extant 10th century buildings of Constantinople. The new dating makes the Ahmet Paşa Camii the earliest known inscribed cross church in Constantinople.



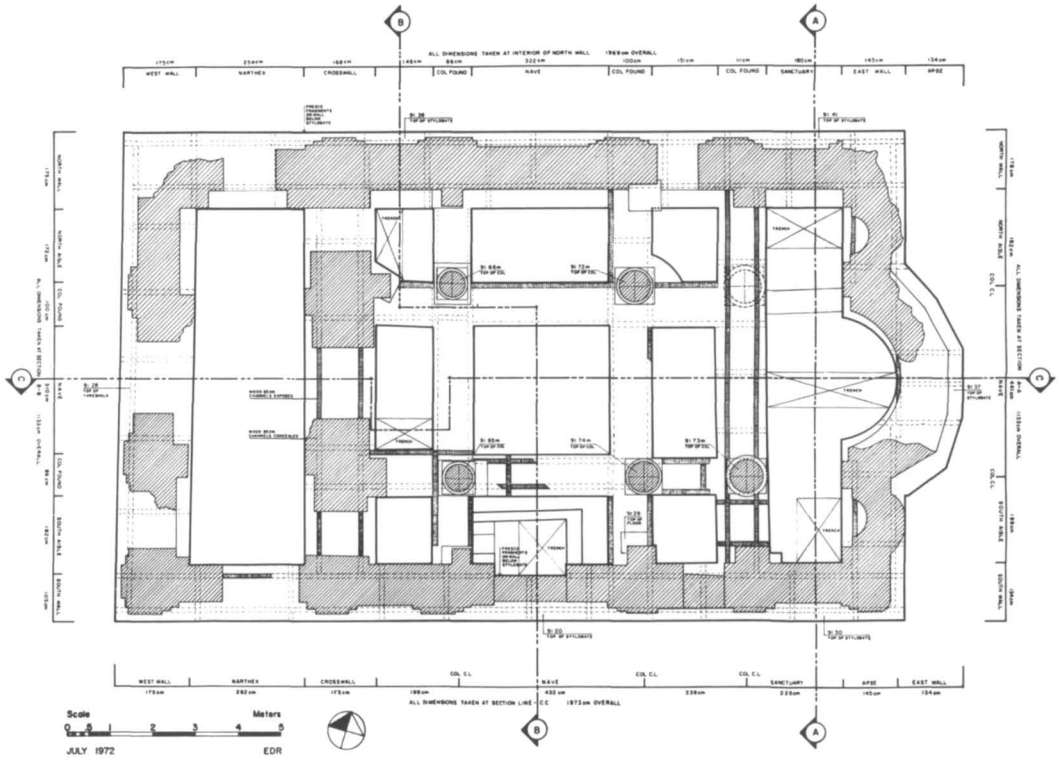
1. Church E from the East before Excavation (1962)



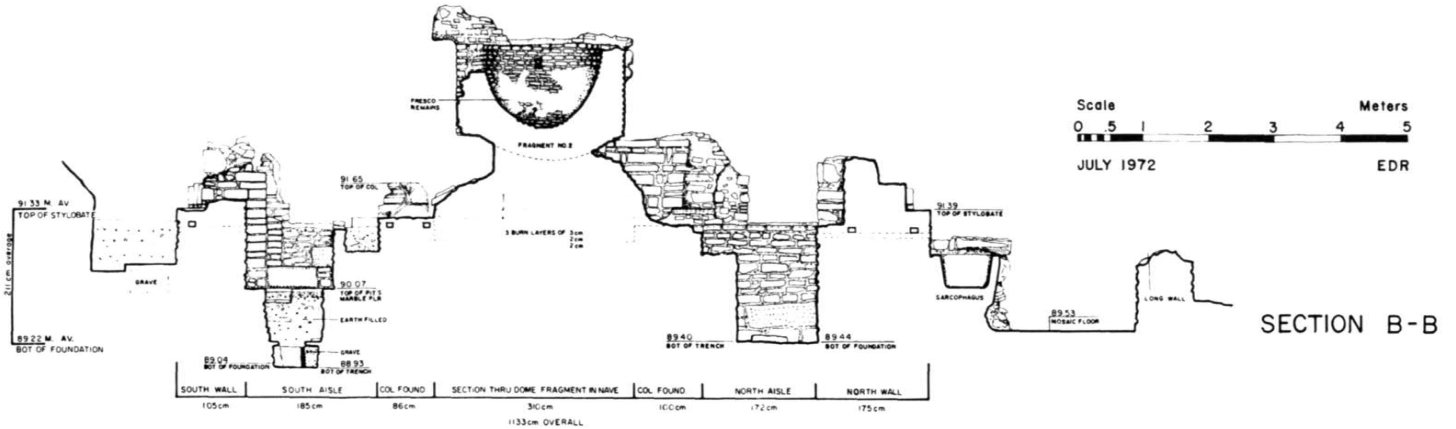
2. Church E from the East after Excavation (1972)



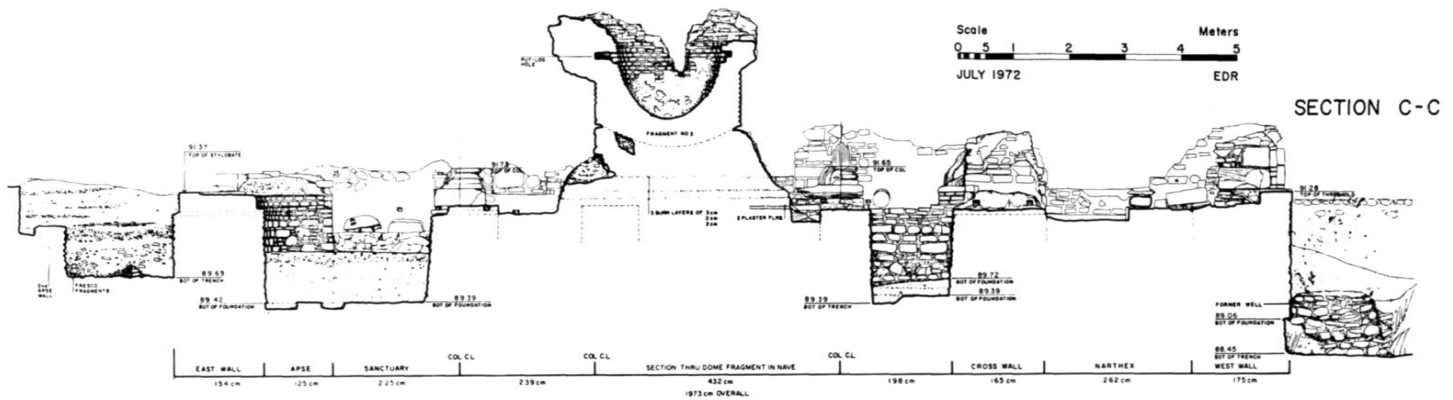
3. Restored Plan of Church E in Sardis



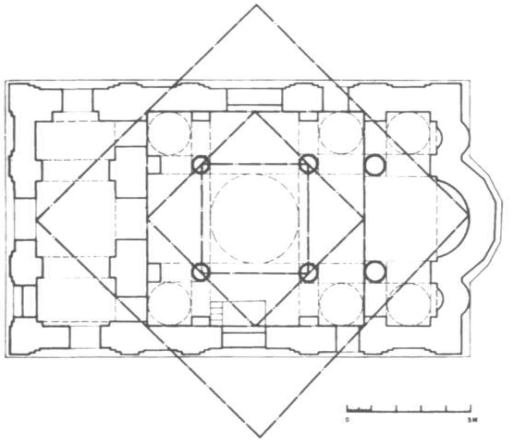
4. Simplified Plan of the Foundation (1972)



5. Section B—B looking West (1972)



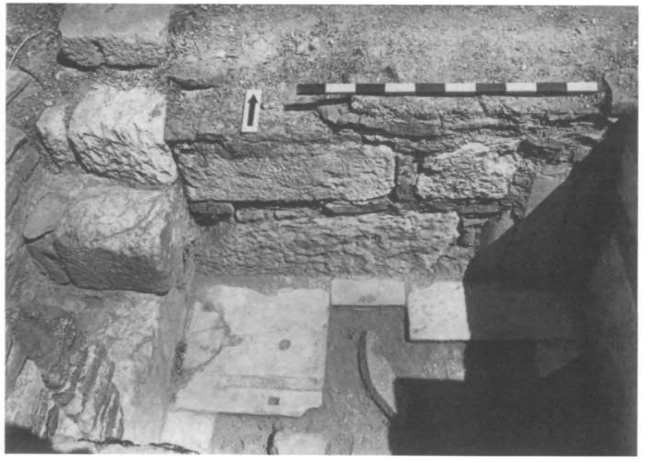
6. Section C—C looking South (1972)



7. Restored Plan with Superimposed Quadratura Diagramm

8. South Facade and Naos from the South East (1972)

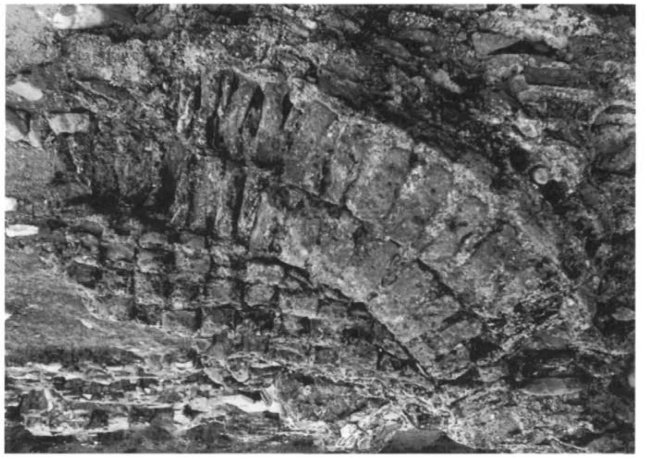
9. North Aisle from the East (1972)



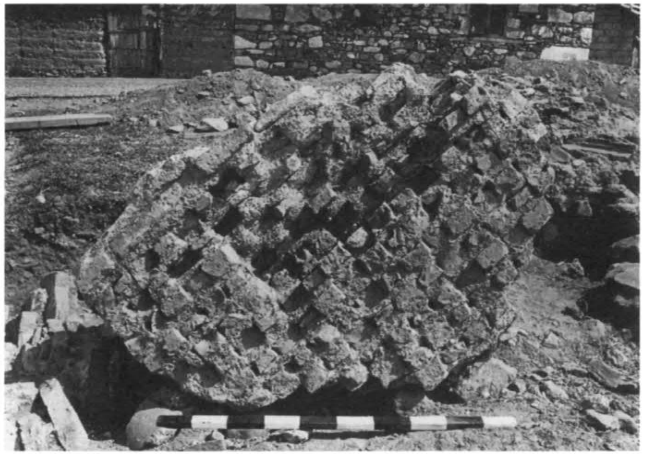
10. Pit (Pseudo-crypt) in the South Aisle from South (1972)

11. Fallen Dome in situ in the Naos from South (1972)

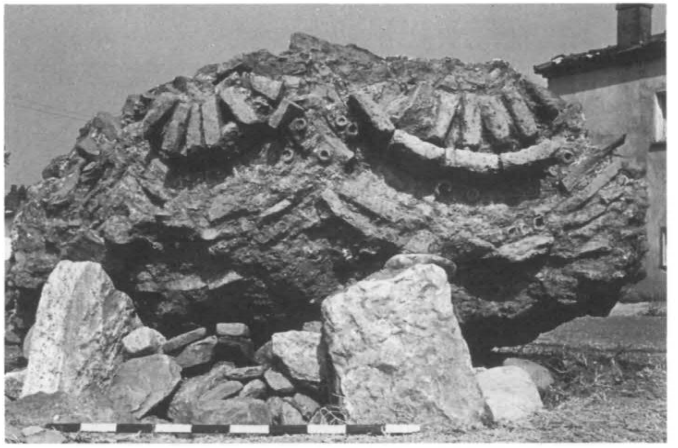
12. Fallen Dome Fragment with Brick Meander Frieze (1972)



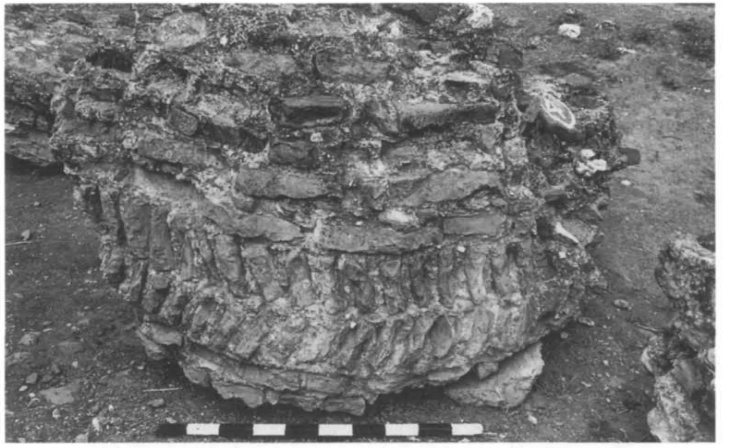
13. Masonry Fragment from the North Facade (1972)



14. Masonry Fragment from the South Facade (1972)



15. Masonry Fragment from the Major Apse (1972)



16. Masonry Fragment from the North Apse (1972)

17. Kariye Camii in Istanbul, Detail of the East Facade (1960)

18. Ornamental Sea Wall Facing the Marmara in Istanbul (1960)

19. Largest Church on Kaiwe Assar Adassi in the Bafa Göl, Apse Detail (1972)

20. Same as Fig. 19, North Facade (1972)

21. North Western Tower of the Upper Citadel of Manissa, Detail (1975)

22. Kemali Kilisse (Pantobasilissa) in Tirilye, Apse Detail (1965)

23. Bodrum Camii in Istanbul, Narthex Detail (1960)

24. Ahmet Pasa Mescidi in Istanbul, Detail of the Major Apse (1960)

25. Cruciform Church on the Island near Heracleia in the Bafa Göl, Detail of South Apse (1972)

26. Eski Imaret Camii in Istanbul, Detail of the Lower South Face of the Major Apse (1973)

decorative intentions[96]. While at present this is the earliest such niche in which the masonry is clearly visible, similar but smaller niches exist as early as the 8th century in St. Sophia in Salonica and in the church of the Archangels in Sige, in which similar or earlier vaulting forms may be hidden under plaster and later alterations[97]. No later than the second half of the 11th century the entire repertoir of vaulting forms developed out of structural reasons was used on the eastern facades of the Kilisse Camii and the Eski Imaret Camii, apparently with a still somewhat tentative appreciation of their decorative qualities[98]. The richness of these vault forms is finally fully exploited for its ornamental character in the ripe Comnenian churches such as the Kariye Camii, the Zeyrek Camii, the Gül Camii, and the ornate sea wall facing the Marmara[99].

Neither in the Fenarî İsa Camii nor in the Bodrum Camii are the lunettes of blind arcades treated with brick patterns similar to those of the corresponding exedral niches because, presumably, such a treatment was properly reserved for vaults, where it fulfills a purpose. In the Eski Imaret Camii and the Kilisse Camii, however, the lunettes of some of the blind arcades are treated with patterns similar to those of nearby exedral vaults, and in the 12th century churches noted above this process of unifying the appearance of all the facade niches is continued[100]. In all these churches, with the possible exception of the

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[96] Best illustrated in SCHÄFER, Architekturhistorische Beziehungen, pl. 89/1.

[97] BUCHWALD, Sige, 61.

[98] Fn. 58, particularly PASADAIOS; also MANGO Architettura, pl. 257; for the Kilisse Cami PASADAIOS 21ff., pl. 3Θ: A and passim; SCHÄFER ibid. pl. 90; IDEM, Die Gül Camii in Istanbul. Tübingen 1973, pl. 29; VAN MILLINGEN, Byzantine Churches, 243ff.; EBERSOLT and THIERS, Les églises, 148ff.; T. MATHEWS, The Byzantine, 386ff.

[99] Fn. 59; PASADAIOS ibid. passim; SCHÄFER, ibid. pl. 1ff.; MANGO, ibid. pl. 260, 262.

[100] N. BRUNOV, Ein Denkmal der Hofbaukunst von Konstantinopel. *Belvedere* 51—52 (1926) 217ff. first observes the development in the use of niches on apse facades, which has recently also been examined by SCHÄFER, Architekturhistorische Beziehungen, 211ff. While I agree with many of the conclusions and welcome the comparisons with Russian examples, the following points in S. argument, insofar as it deals with the material presented here, must be corrected: the niches over the windows of the prothesis and diaconicon of the Fenarî Isa Camii north church are not exedral, but rectangular in plan, (whereas all three niches above the windows of the south apse, which was built together with the north church, are exedral in plan but are not mentioned by S.); the example which follows the Fenarî Isa Camii chronologically is not the Eski Imaret Camii but the Bodrum Camii (cf. BUCHWALD, Sige, fn. 308); not only the Kilisse Camii, but also the Eski Imaret Camii has blind arcades flanking the exedral niches of the apse exterior, and these are, moreover, more richly decorated with brick patterns than those of the Kilisse Camii (SCHÄFER, Gül, pl. 29); the proposed date of the Eski Imaret Camii before that of the Kilisse Camii has therefore yet to be proven; as pointed out above, neither the vaulting in the facade niches nor that in the roof chapels of the Fenarî Isa Camii is laid in

Zeyrek Camii and the sea wall, which was decorated only with exedral niches, herringbone brickwork comparable to that of Sardis E is used in blind arcades.

With the exception of Russian and Venetian examples directly dependent upon the Constantinopolitan development outlined above[101], neither herringbone brickwork nor other closely related forms are found in the Byzantine area outside Constantinople before the 13th century. The earliest extant examples are found on the narthex of the church of St. Theodora, probably built in the second third of the 13th century, and on the eastern facade of the Parigoritissa, both in Arta[102]. In both the herringbone brickwork is used outside the context of blind arcades or facade niches. Indeed, the original Constantinopolitan application of herringbone brickwork in the vaults or the lunettes of facade niches does not seem to appear in the provinces before the 14th century except in isolated instances, for instance in the large church on Kaiwe Assar Adassi and, on the interior, in the cruciform church on the island near Heracleia[103]. Later examples of herringbone brickwork, for the most part in the context of facade niches or blind arcades, include the Palaiokatounas church in Aetolia[104], the west facade of the narthex of St. Sophia in Ochrid[105], the apse of the church of the Holy Apostles in Salonica[106], St. George in Omorphoklissia[107], Gracanica[108], the south (but not the east) facade of the Afentico in Mistra, which belongs to a later addition[109], the apse of St. Sophia

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radial courses; herringbone brickwork appears on the apse exterior not only in the Kariye and the Gül Camii, but already in the Eski Imaret Camii, in a small blind arcade on the south face of the major apse (Fig. 26) and in the Kilisse Camii in the lunette over the window of the northern apse and on the northern face of the major apse; for reasons shown above it is incorrect to say of the vaults of the facade niches ". . . bei denen *ornamentale* Ziegelmauerung *von Anbeginn* auftritt" (italics added).

[101] SCHÄFER, ibid. for the Russian examples; in the Veneto I have noted the late 11th century construction of San Marco, the Cathedral of Jesolo, Santa Sophia in Padua, and San Donato in Murano (H. BUCHWALD, The Carved Stone Ornament of the High Middle Ages in San Marco, Venice. *JÖBG* 11/12, 13 (1962/3, 1964) 169ff., 137ff. for further references).

[102] MANGO, Architettura, 254ff., fig. 280 with further references; fn. 41, particularly 29ff., fig. 19, 22.

[103] WIEGAND, Latmos, 18f., fig. 24 (the reconstruction in fig. 26 is erroneous concerning the dome, the flanking chapels, and the area between the narthex and the dome), 43ff. Also Fig. 25 infra.

[104] Fn. 88.

[105] Best illustrated in MANGO, ibid. fig. 342; D. BOSKOVIĆ and K. TOMAVSKI, Musée National d'Ohrid, Recueil de Travaux. Ochrid 1961.

[106] Fn. 43.

[107] Fn. 75.

[108] Fn. 46.

[109] MILLET, Monuments, pl. 23—3, 5, 25—2; fn. 47.

in Mistra[110], a tympanon of Sts. Theodoroi in Mistra[111], and St. John Aleiturgitus in Nessebar[112].

The chevron frieze, found on the northern apse of church E in Sardis (fig. 16, p. 269) can be, and most probably was derived from the herringbone brick patterns evolved in Constantinople in the 11th and 12th centuries, an observation which is supported by the fact that the motif can apparently not be demonstrated in extant examples before the 13th century. One of the earliest examples, on the south apse of the Fenarî İsa Camii south church has a complex form still closer to the surface filling quality of herringbone brickwork than the simpler, more directional chevron frieze of Sardis[113]. However, many of the motifs in the same facade are taken directly from the 11th and 12th century Constantinopolitan repertoir[114], and this transitional chevron pattern could therefore also well have been developed in this earlier, inventive period. Indeed, such transitional forms continued to be used occasionally in the 14th century, for instance in St. Nicolas in Verroia[115] and in the church of the Archangels in Lesnovo[116]. Simple chevron friezes similar to that of Sardis not only in form but also in their location on the apse are, moreover, found in the church of St. Catherine in Salonica[117], and in St. Basil in Arta, which may have been built before the Fenarî İsa Camii south church[118]. I have also noted chevron friezes on the dome of the church of the Blachernae monastery in Arta, on the apse of St. Clement in Ochrid, and on the western facade of the narthex of Sts. Theodori in Mistra[119].

The checkerboard pattern used in the lunettes of the Sardis facades (fig. 13, 14 and p. 268) is also a relatively rare motif in Byzantine architecture

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[110] CHATZIDAKIS, Μυστρᾶς, 68ff.; MILLET, ibid. pl. 29 for the tympana with the same motif. I know of no published illustration in which the motif in the lunette of the apse window is recognizable.

[111] CHATZIDAKIS, ibid. 49ff.; the restored side is illustrated in MANGO, Architettura, fig. 307. Cf. also MILLET, ibid. pl. 11, 14 for other late examples in Mistra.

[112] Fn. 50; also PASADAIOS, Κεραμοπλαστικός, pl. 11ff. for later examples in Constantinople.

[113] Fn. 74 and MANGO, Architettura, pl. 287.

[114] PASADAIOS, ibid., passim; the meander of the major apse is very similar to that of the ornamental sea wall and the Kariye Camii, and the frieze of triangles is found in the Gül Camii.

[115] MILLET, L'école grecque, fig. 124; the church is not firmly dated but the brick ornamentation would fit well into the 14th century development.

[116] DEROKO, Architecture, 184ff., fig. 258.

[117] Fn. 42; KRAUTHEIMER, Early Christian, fig. 387 (barely visible in the shadow of the roof).

[118] Fn. 85.

[119] Fn. 82, 87, 111; the narthex of Sts. Theodori is a later addition; I know of no published illustration of this side of the church.

and, like the chevron, does not seem to appear in extant monuments before the 13th century. The earliest examples known to me occur in Hagios Basileios and in the Parigoritissa in Arta, and in St. Clement in Ochrid[120]. In contrast to the Sardis checkerboard however, these patterns are produced by juxtaposing dark and light square tiles or small stone plaques which are organized diagonally within a linear frieze, suggesting that they derive from the diagonally organized reticulate revetments which were apparently used in Byzantine architecture as early as the 9th century, and which ultimately depend upon Roman *opus reticulatum*, although Islamic sources are also possible[121].

However, reticulate revetments are not necessarily the only point of departure for the Sardis checkerboard motif. On the western facade of the Parecclesion of the Fethiye Camii in Constantinople, built about 1310, a diagonally organized checkerboard pattern similar to those in Arta is used together with a second checkerboard pattern which is organized vertically, in which the dark squares are formed of vertical bricks[122]. This form, which is more similar to that of Sardis than are those of Arta and Ochrid not only because of its vertical organization and use of brick, but also because it is found in the lunette of a blind arcade, is in turn reminiscent of simple brick basketry patterns the earliest of which is found on the north facade of the Kilisse Camii, also in the lunette of a blind arcade[123]. While on the one hand these comparisons suggest that the Sardis checkerboard pattern was derived from brick basketry patterns rather than reticulate revetments, on the other hand the fact that the combination of brick with tiles or stone plaques in checkerboard patterns seems to occur in relatively late examples indicates that, instead of being an early transitional form, it may be a late form which fuses two distinct traditions. I have noted examples similar to that of the Fethiye Camii, for instance, in the Tekfur Serai[124], in a former church now

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[120] Fn. 85, 86, 87.

[121] A. H. S. MEGAW, Reticulate Revetments, 10ff.

[122] H. HALLENSLEBEN, Untersuchungen zur Baugeschichte der ehemaligen Pammakaristoskirche, der heutigen Fethiye camii in Istanbul. *Istanbuler Mitteilungen* 13/14 (1963—64) 128ff. with further references; best illustrated in MANGO, Architettura, fig. 288; Also C. MANGO and E. HAWKINS, *DOP* 18 (1964) 319ff.; PASADAIOS, Κεραμοπλαστικός, pl. 32.

[123] IDEM, pl. 3, 19; the motif existed in original masonry before the recent restoration; I know of no published photograph in which the motif is visible. IDEM, pl. 19, 20 for examples on the north facade of the ambulatory of the Kariye Camii and on the eastern facade of the Fenarî Isa Camii south church.

[124] IDEM, pl. 9, 10, 32, 50; also WULZINGER, Byzantinische Baudenkmäler, 64ff.; B. MEYER-PLATH and A. M. SCHNEIDER, Die Landmauer von Konstantinopel. Berlin 1943, 95ff. date the building to the first half of the 14th century, while C. MANGO, Constantinopolitana. *Archäologischer Anzeiger* 80 (1965) 330ff. suggests a date between

known as the Kemali Kilisse in Tirlye (Fig. 22)[125], and in the churches of the Paraskevi, the Archangels, and St. John Aleiturgitus in Nessebar[126].

The checkerboard pattern constructed only of brick in a manner similar to that of Sardis seems also to be a particularly late decorative form, and its use, except in Sardis, was apparently limited to northern Greece and Serbia. The earliest example known to me is found, like that of Sardis in the lunette of a blind arcade, in the Chilandari, rebuilt 1303[127]. Still later examples exist in the church of the Holy Apostles in Salonica[128], in St. Nicolas in Ljuboten, 1337, Lesnovo, 1341, the Bogorodica in Kuceviste, 1348, Markov monastery, 1371, and St. Andrew on the Treska, 1389. The use of the checkerboard pattern reached its boldest and most striking form of articulation in the precisely detailed churches at Krusevac, 1374, Ravanica, 1381, and Kalenic, 1413—17[129].

3. Historical and Archaeological Evidence

The obvious conclusion which must be drawn from an analysis of the most significant stylistic features is that church E was probably not built *earlier* than the 13th century. The available historical evidence, on the other hand, permits the conclusion that church E cannot have been built *later* than the 13th century.

Already towards the end of the century the hinterland of Sardis was under the control of the Turks, and the city itself fell at an unknown date

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1261 and 1291. Stylistically the building must be attributed to a period following the construction of the Fenarî Isa Camii south church, because its polychrome brickwork is considerably richer and makes use of cut marble plaques as well as of cut stone voussoirs, both found in the Fethiye Camii parecclesion but not yet in the Fenarî Isa Camii.

[125] F. W. Hasluck, Bithynica. *Annual of the British School at Athens* 13 (1906—7) 291ff. with earlier references; the building has apparently again been published by C. Mango and I. Ševčenko in an article which was not available to me at the time this manuscript was completed (*DOP* 27 [1973] 235—277). The rich detailing of the apse and the use of cut stone voussoirs on the lateral facade arches indicate that the building is later than church E and than the Fenarî Isa Camii south church and that it could well be roughly contemporary with the Tekfur Serai and the Fethiye Parecclesion.

[126] Rachenov, Mesembria, passim; the very close similarity of many decorative facade features particularly in St. John with those of the Tekfur Serai implies that the two buildings were built at approximately the same time, conceivably by the same workshop or at least by some of the same workmen.

[127] Just visible in Millet, L'ancien art, 95f., fig. 88.

[128] Fn. 43.

[129] Millet, ibid. 106ff. and figs. 117, 119, 122, 131, 135; Deroko, Architecture, 181ff. and figs. 255, 257, 258, 263, 311, 312, 314, 383, 387, 391, 393, 395, 341, 345, 436, 394, 396; V. Korac, Les origines de l'architecture de l'école de la Morava, in: Moravska skola i njeno doba. Belgrade 1972.

not long after 1300. Indeed, activity at Sardis appears to have been minimal in the period before the 13th century and after about 1260, when the center of Byzantine power shifted from Asia Minor to Constantinople. Frequent Turkish raids in Lydia are reported already during the reign of Michael Paleologus, 1259 to 1282[130].

Only in the Lascarid period from 1204 till 1261 does Sardis appear to have enjoyed the safety and prosperity during which the construction of a new church as well built and as richly and carefully detailed as church E may be expected. Within this period the reign of John Vatatzes, 1222 to 1254 is the period during which its construction would be most likely. Vatatzes spent much of his time in Nymphaeum and Magnesia on Sypilus, both not far from Sardis, and is known to have founded the monastery of Sosandria on Mt. Sipylus, where he was buried[131].

The coin finds of the archaeological excavations support the conclusions which may be drawn on the basis of the sources. While 22 coins were found in Sardis from the period of about 80 years between 1118 and 1204, 50 coins were found in the much shorter period from 1204 to 1261, and only three coins can be attributed to the roughly equivalent period from 1261 to 1308[132].

An attribution of church E to the Paleologue, rather than to the Lascarid period is improbable not only because of the historical and archaeological evidence adduced above. A number of minor changes were carried out in the building still during Byzantine occupation using different masonry techniques each of which may be clearly distinguished from that used in the construction of the church. The earliest is undoubtedly the closing of the doorway which led into the naos from the south with a wall built of masonry typical of the church E facades except that it uses fine earth instead of mortar. Others are the construction of a low pier entirely of brick in the south west corner of the pit (pseudo-crypt) in the south aisle, and of a wall of field stone and roughly hewn ashlar bonded with earth between the bema and the north east bay of the church[133]. Moreover, three layers of fresco may be traced on those walls

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[130] Foss, Byzantine, 78ff. with further references and the relevant sources.

[131] Idem, 76ff.; A. Heisenberg, Kaiser Johannes Batatzes, 166ff.

[132] H. W. Bell, Sardis 11, part 1. Leyden 1916; G. Bates, Byzantine Coins. Cambridge, Mass. 1971 (the seven coins dated between 1143 and 1261 have not been included in the above summary); coins uncovered after 1968 are not included in Bates. I have included the above summary in spite of the controversy about the validity of such evidence and in spite of the fact that many of the Lascarid coins were found in a single hoard only as a rather dramatic illustration of the historical picture given by the written sources. The hoard of Lascarid coins itself no doubt illustrates the unsettled conditions which prevailed after that short but prosperous period.

[133] This wall is built of masonry distinctly different from those of the Turkish period in church E.

of the pseudocrypt which are contemporary with church E[134]. Church E was therefore certainly in use for a considerable length of time before the fall of Sardis to the Turkish forces.

III. Conclusion

The concurrence of stylistic, historical, and archaeological evidence permits the conclusion that church E was built in the 13th century, most probably during the period of the Lascarid dynasty between 1204 and 1261. Church E at Sardis is therefore at present the only church of which extensive portions remain which may reasonably be attributed to the Lascarid dynasty, or so-called Empire of Nicaea, an observation which gives the building far more importance in the history of Byzantine architecture than it seems to have had when it was constructed[135]. Moreover, this observation immediately opens the door to a great many questions the most important of which are: from where did the forms of church E come, and what influence may they have had on the formulation of the Paleologue architectural style?

Although a definitive answer to these questions is not possible within the framework of the present investigation, and indeed may never be possible because of the loss of the relevant monuments, I would nevertheless like to make the following tentative observations:

1. Church E was built earlier, and with all probability several decades earlier than churches with a similar plan and vaulting solution in Mistra and Bulgaria. Such typical Constantinopolitan features as the spacious bay between the apse and the eastern cross arm, the pendentive domes over the eastern bays of the side aisles, the polygonal apse articulated by blind arcades, and perhaps the domical vaults over the central bay of the narthex are found in Sardis earlier than in Mistra or in Nessebar. A transmission of at least some of these features from Constantinople to other provinces by way of Asia Minor may therefore perhaps be postulated. The time lag between Lascarid Sardis and High Paleologue Mistra and Bulgaria could, conceivably, be explained by

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[134] Only a single layer of fresco was found in the dome now lying in the middle of the naos, suggesting that the two additional layers in the pseudo crypt were not applied in the course of general renovations, but that they became necessary because of the active use of the minutely dimensioned pit.

[135] The only other church known to me which has been attributed to the Lascarid period was excavated in Iznik and has been tentatively identified as the church of St. Tryphon. Unfortunately it is very poorly preserved and the attribution to the Lascarid period is uncertain. S. Eyice, Iznik'de bir bizans kilisesi. *Belleten* 13 (1949) 37ff; I. Papadopoulos, Ὁ ἐν Νικαίᾳ τῆς Βιθυνίας ναὸς τοῦ Ἁγίου Τρύφωνος. *EEBS* 22 (1952) 110ff.

assuming that master builders or building crews escaping the Turkish onslaught towards the end of the 13th century found refuge in present Greece or Bulgaria.

2. The cylindrical drums of Sardis E are typical features of the early five domed inscribed cross churches such as Nikli and the Calabrian examples, and are not found in contemporary Constantinople. They are still found in a transitional form in the Pantanassa near Monemvasia towards the end of the 12th century, and this feature at Sardis may therefore indicate that the five domed solution at Sardis depends upon the southern Greek tradition[136].

3. The richly profiled blind arcades of the Sardis facades are characteristic of 11th and 12th century Constantinopolitan architecture, but are not found in southern Greece. On the other hand, blind arcades just as rich as those of Sardis are found in several churches of Asia Minor (Ucayak, Canlikilisse, the 11th century reconstruction of the Koimesis in Iznik) and the Constantinopolitan tradition need therefore not have supplied the prototypes for Sardis. To the contrary, earlier forms of blind arcade articulation in Asia Minor (Dere Agzi, Sige, Side, Islamköy) indicate that the facade articulation of church E was built within a tradition which, whether or not it originated there, had firm rootes in Asia Minor as early as the 8th century.

4. The particular forms of the meander used at Sardis appear to have their closest parallels in southern Greece in the 12th century (aside from those found in Asia Minor). The other ornamental brick motifs of the Sardis E facades, however, cannot be demonstrated in earlier monuments in other Byzantine provinces and could well have come either from the capital or have been developed locally. In no other building built before the Paleologue period is such a large number of different ornamental brick motifs used in

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[136] The use of cylindrical forms in the minor drums and flanking apses of church E could lead to the interpretation that the building was built earlier than the 13th century. For historical reasons it would then probably have been built in the 11th century before the battle of Manzikert (Foss, ibid., 66ff.). However, for reasons already proposed I hold this interpretation to be most unlikely. It would presuppose that numerous architectural and decorative features are found in Sardis very much earlier than elsewhere. The cylindrical forms are more probably to be explained, at least in this case, as a revival of earlier features, a process which seems to have been a continuous, if only occasionally employed characteristic of Middle Byzantine architecture. The cylindrical major apse of the church of St. Catherine in Salonica appears to be another example of the same process. The lack of windows in the Sardis E domes may be an additional design factor which led to the cylindrical solution here. The polygonal drum solution of later churches (10th century in Istanbul, 11th and 12th century elsewhere) is a structural improvement over the earlier cylindrical solution, because the construction of window arches is simpler and more secure in the straight walls of drums built on a polygonal plan. In the windowless Sardis domes, however, the polygonal plan is unnecessary, and the simpler, cylindrical drum, which is easier to construct if the dome has no windows, is more logical.

such a strictly ordered manner. Where a highly controlled, ordered composition is maintained, as in the churches of the Argolis, the number of motifs is strictly limited, while in examples where a large number of motifs is used, for instance in Epirus, they are usually composed freely without regard for an ordered or symmetrical distribution.

5. The use of the *quadratura* in Sardis roughly at the same time as it appears in the sketchbook of Villard d'Honnecourt appears to me to be of great importance. While its use can be traced in Constantinople also in earlier examples, and it may well have been used earlier than the 13th century in the West, certainly the inscribed cross plan seems better suited to this particular application of the *quadratura* than the architecture presented in the sketchbook. In spite of (and perhaps because of) the enormous mass of literature which has appeared about the use of proportion in historic architecture the serious investigation of its use is still in its infancy.

Note to Illustrations

I am grateful to the Archaeological Exploration of Sardis for permitting me to publish the illustrations shown in Figs. 1, 2, 4, 5, 6, 8—16. The remaining drawings and photographs were made by the author. The dates are given in the captions because all of the monuments shown are in a state of flux, whether because of continuing excavation, because of preservation, or because of deterioration. As well meant as the various repairs and restorations may be, they almost invariably change not only the original charm and artistic value of the monument but also its value as a document of architectural history.

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IV

NOTES ON THE DESIGN OF AISLED BASILICAS IN ASIA MINOR

A great number of Christian basilicas has been recorded in Asia Minor. It is the purpose of this paper to present observations concerning how they were designed. The investigation will concentrate upon simple aisled basilicas, and is based partially upon studies carried out in the course of my work on the reconstruction of church EA in Sardis[1].

The *simple aisled basilica* is defined as a basilica with a nave, two aisles, a projecting apse, and frequently a narthex. It differs from other basilicas primarily in that: 1. the apse lacks flanking chambers; 2. there is no transept. It was one of the dominant forms among the numerous Christian basilicas which have been recorded in Asia Minor, and it is the simplest, most elementary representative of the aisled basilica church type.

It seems clear that the architect[2] was probably not involved in making basic choices which would have been his prerogative during other periods. In most cases the basilica must have been the only church type under consideration. Whether or not chambers flanking the apse were to be included was obviously determined by functional considerations. For the architect they were features which were either to be included in, or excluded from his commission, depending upon the decision of those responsible for the construction of the church. Their number, size and location were also, for the most part, predetermined by others. The architect may have been able to decide whether they would be inscribed, as in the Church of St. Mary at Ephesus[3], or additive as in Ayatekla Church No. 1[4]. However, the

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[1] H. Buchwald, The Churches of Sardis (Archaeological Exploration of Sardis, Cambridge MA, in publication).

[2] I use the term *architect* in today's sense as the person who is responsible for the design of the building. C. Mango, Byzantine Architecture (Milan 1978, 1st paperback ed. London 1986) pp. 14–18, for discussion of the use of the term in Early Byzantine times, and the architect's role on the building site and in society.

[3] Forschungen in Ephesus, 4-1, Die Marienkirche (Vienna 1932); F. Fasolo, La Basilica del Concilio di Efeso, in: Palladio n. s. 5–6 (1956) pp. 1–13, dates the church to the 4th century; F. W. Deichmann, Zur spätantiken Bauplastik von Ephesus, in: Mansel'e Amargan (Ankara 1974) pp. 549–553, for a critical summary of previous attempts to establish chronology and strong arguments for a 4th century date; C. Foss, Ephesus after Antiquity, a Late Antique, Byzantine and Turkish City (Cambridge 1979) p. 52 f for a summary of the evidence.

[4] E. Herzfeld, S. Guyer, Meriamlik and Korykos. Monumenta Asiae Minoris Antiqua 2 (Manchester 1930) pp. 4–46; H. Hellenkemper, Kommagene – Kilikien – Isaurien, in: Reallexikon z. byz. Kunst 4 (Stuttgart 1984) pp. 228–235, with plan, summary of recent scholarship and chronological evidence which is interpreted as dating the church about 375; C. Mango, Isaurian Builders, in: Polychronion. Festschrift für Franz Dölger (Heidelberg 1966) p. 364, suggests a construction under Emperor Zeno (474–491). The site formerly known as *Meryemlik* is now called *Ayatekla*. I use the title *Ayatekla Church No. 1* rather than the usual "Basilica of St. Thecla" because several churches may have been dedicated to St. Thecla in the precinct.

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great number of other variations in Asia Minor must, in some cases, have required architectural design decisions and ingenuity. On the other hand, it would be impossible to attempt an evaluation of the design of these chambers without a detailed understanding of how each was used.

Without entering into a discussion of the many reasons which have been suggested for the use of transepts in basilicas, it is relevant to note that in Asia Minor: 1. transepts are relatively rare; 2. they can probably not be associated with a particular functional type of church building. Even though few of the major churches in Asia Minor have transepts, both of the large basilicas in the center of Perge do[5]. There is no reason to believe that their functions differed from those of other large basilicas in medium sized cities of the region. These transepts therefore probably had the primary purpose of providing abundant unobstructed space close to the altar; the added architectural interest which was also achieved must have been welcome. The differences in the two solutions in Perge show that there was no standard for transepts in an aisled basilica, and that problems, for instance in the relationship between the aisles and transept, had to be resolved which required architectural expertise. The forms of transepts here, and probably elsewhere in Asia Minor, were at least in part products of architectural design decisions.

It is more effective, in a study of the design of Christian basilicas in Asia Minor, to concentrate upon the simplest representative of the type, the simple aisled basilica. With the numerous examples which have been recorded, and because of its uncomplicated internal arrangement, it is best suited for our investigation.

While most simple aisled basilicas in Asia Minor remain undated, Church EA in Sardis may have been built as early as the middle of the 4th century[6], and several simple aisled basilicas, for instance at Kydna[7], Letoon[8] and Miletus[9] have been attributed to the 6th century. The type may well have been prominent throughout the Early Byzantine period.

In Asia Minor the simple aisled basilica is known primarily from floor plans; it cannot be defined in terms of its interior elevation or transverse section. Most simple aisled basilicas are so poorly preserved that there is no evidence to permit the reconstruction of galleries, clerestories, or the use of a trabeated or arched support system. Even the intercolumniations and forms of the capitals and nave supports are frequently missing or unpublished.

The few exceptions serve to confuse rather than to clarify the internal appea-

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[5] H. Rott, Kleinasiatische Denkmäler. Studien über christliche Denkmäler 5, 6 (Leipzig 1908) pp. 46–54.

[6] H. Buchwald, The Churches of Sardis (as in fn. 1).

[7] J. - P. Adam, La basilique byzantine de Kydna de Lycie, in: Rev. Arch. (1977) pp. 53–78.

[8] H. Metzger, Fouilles du Letoon de Xanthos (1962–1965), in: Rev. Arch. (1966) pp. 101–112.

[9] W. Müller-Wiener, Die Grosse Kirche (sog. Bischofskirche) in Milet, in: Istanbuler Mitt. 23–24 (1973– 74) pp. 131–134; O. Feld, Zur kunstgeschichtlichen Stellung der Grossen Kirche, ibid. pp. 135–137.

rance of the simple aisled basilica. Basilicas in Canbazlı(Cilicia)[10], Miletus[11] and Didyma[12], have been reconstructed with galleries. But of the numerous unusually well preserved examples in Binbirkilise only one has them[13]; the architecture of the villages on the lower flanks of the Kara Dağ now known collectively by that name must reflect building patterns in populated centers like Konya (Iconium), only about 100 km away, or those of the Cilician coast, which is not much farther.

The sizes of selected typical simple aisled basilicas in Asia Minor are shown in Table 1. Most dimensions were measured from published plans and are approximate, but serve the purpose of this overview.

The geographic distribution of simple aisled basilicas by size is surprising, for none of the largest is located in the rich western coastal plains and valleys. If we include large basilicas of other types in the comparison (Table 2), with the single exception of the Church of St. Mary in Ephesus, which is the longest Christian basilica in Asia Minor, all are on the south coast or inland. The largest churches recorded are not simple aisled basilicas. While Ayatekla Church No. 1 (Meryemlik) is shorter than St. Mary's, with its overwhelming width its nave is greater in area (1034 vs. 944 sq. m.). The exceptional size of St. Mary's can be explained by the importance of Ephesus throughout Early Byzantine history, and by the events which probably led to its construction[14]. The great size of Ayatekla No. 1, the major pilgrimage church of St. Thecla, may perhaps be explained by imperial patronage[15].

Most other large churches were constructed in medium sized cities, apparently with local patronage. In Asia Minor medium sized nave lengths range from 20 to 30 m.; naves over 30 m. are among the longest of the region. Of the numerous simple aisled basilicas which were measured, only the very smallest are comparable in scale with typical inscribed cross churches of the Middle Byzantine period.

The churches of Binbirkilise are of particular interest in a discussion of scale. Church No. 1 is comparable in length with basilicas in important secondary cities, even though the villages now known as Binbirkilise probably rivaled them neither in size nor prosperity. A medium sized basilica appears to have been standard, wi-

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[10] G. Forsyth, An Early Byzantine Church at KanlıDivane in Cilicia, in: De artibus puscula 40. Essays in Honor of Erwin Panofsky (New York 1961) pp. 127–137; S. Eyice, La Basilique de Canbazlıen Cilicie, in: Zograf 10 (1979) pp. 22– 29.

[11] See fn. 9 above.

[12] H. Knackfuss, Das Heiligtum nach dem Aufhören der Arbeiten am Tempelbau, in: Didyma, ed. by T. Wiegand (Berlin 1941) p. 32.

[13] W. Ramsey and G. L. Bell, The Thousand and One Churches (London 1909); C. Holzmann, Binbirkilise. Archaeologische Skizzen aus Anatolien (Hamburg 1904); S.Eyice, Karadağ (Binbirkilise) ve Karaman çevresinde arkeolojik incelemeler (Istanbul 1971); J. Strzygowski, Kleinasien, ein Neuland der Kunstgeschichte (Leipzig 1903); W. Nausch, Untersuchungen zur Pfeilerbasilika im 9. Jahrhundert in Kleinasien (Diss. Munich 1977); R. Lienhardt, The Great Basilica, Church No. 1 at Bin Bir Kilise in Anatolia, in: Journ. of Soc. of Archit. Hist. 24 (1965) pp. 300–303.

[14] See fn. 3 above.

[15] See fn. 4 above.

thin the financial reach even of small, unimportant communities. The large number of small basilicas in Binbirkilise may reflect the norm rather than the exception: other cities probably also had numerous small churches which have not survived. Parallels exist in Italy, where small towns may have a number of churches, many founded during the Early Byzantine period. The smallest churches of Binbirkilise demonstrate that the simple aisled basilica was the preferred solution even when a basilica without aisles would have provided more unobstructed space and required less labor and building material. On the other hand, the nave vault of a single cell basilica would have a greater span, and lack the buttressing effect of side aisles.

Modular grids were probably used in the design of many simple aisled basilicas. Architectural features with dimensions apparently designed using a modular grid include the nave without the apse, the aisles, the nave and aisles together, the narthex, and at times all features of the church excluding the apse. The grid may have been a conceptual, rather than a practical device, which was used to organize the plan and to obtain proportional relationships which can be expressed in numeric ratios[16]. The three most important ratios were 1. width to length of the nave; width to length of the nave and aisles together; 3. aisle width to nave width. It is these proportions which define the spacial character and appearance of a simple aisled basilica, at least in terms of its floor plan.

Table 3 provides an overview of proportional relationships, based upon published plans and texts with the exception of Sardis EA, which was measured on site. The above caution concerning possible errors in plans, measurement, and construction are also relevant here. Most proportions are approximate, and may in some cases be fortuitous. The proportions are based upon clear as well as axial dimensions, but there is no reason to believe that Early Byzantine architects rigidly adhered to either approach[17]. To design a basilica so that all major dimensions fit into a proportional system was complicated by structural and site constraints. The flexibility provided by using either clear or axial dimensions, at times in the same building, must have been welcome "shortcuts" in practice.

The large number of similar proportions is convincing evidence that in most cases they were intentional. The most common series of proportions relate width to length of the nave as 1:3; width to length of nave and aisles together as 2:3, and width of aisle to width of nave as 1:2. Together with the proportions 1:4 in the

[16] For a more detailed discussion see H. Buchwald, Geometry of Middle Byzantine Churches and Some Possible Implications, which will appear in: Jahrb. Österr. Byz. 42 (1992).

[17] P. A. Underwood, Some Principles of Measure in the Architecture of the Period of Justinian, in: Cah. Archéol. 3 (1948) pp. 64–74 suggests that for court architects during Justinian's reign the clear distance between basilica colonnades provides the basic dimension from which others can be derived, and that the side aisle width was dimensioned half the nave width. He also points out that, because of limitations in measuring techniques and building materials accuracy may normally be expected only to the nearest half foot. Underwood's observations are only partially applicable in Asia Minor. I believe that assuming accuracy to the nearest half foot, when considering Byzantine technology, is overly optimistic. See also the discussion in M. Restle, Studien zur frühbyzantinischen Architektur Kappadokiens vol. I (Wien 1979) pp. 89–135 with additional reference.

narthex and 3:4, which may have occured in vertical dimensions[18], they exhaust the continuum of harmonic musical cords 1:2:3:4 which were important in Platonic and Pythagorean philosophy[19].

In Table 4 the same series of proportions may be observed in the major features of basilicas with other forms. While nave and aisles in Ayatekla No. 1 are arranged like those of simple aisled basilicas, special adjustments were required in Perge A due to the transepts: the nave was proportioned 2:3 to the crossing, while the proportion 1:6 of the aisles steps back to the point where the transept west wall meets the exterior wall of the aisle.

The "classical" proportional series (Table 3, items 1–4, and Table 4, items 1–2) may have been typical of the earliest basilicas in Asia Minor, for Sardis EA, and perhaps also Ayatekla No. 1 may be attributed to the 4th century[20]; H. C. Butler states that five relatively well dated basilicas in Syria with these proportions were built in the 4th century, while later basilicas there have different proportions[21]. However, the same proportions were used in S. Apollinare in Classe, which was built in the 6th century[22], and may have been used in later buildings also in Asia Minor[23].

While proportional relationships cannot be used to date basilicas in Asia Minor, in those attributed to the 5th and 6th centuries there is a tendency either to neglect some aspects of the "classical" system or to use somewhat different ratios[24]. Usually the new ratios are included in the series 1:2:3:4. In a number of basilicas porportional ratios were used only occasionally, and in several, none could be identified. We may conclude that, whatever the origin of the "classical" system of proportions may have been[25], there was no necessity to use it. While

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[18] H. Buchwald, Geometry of Middle Byzantine Churches (as in fn. 16) for the vertical proportions 3:4 in S. Apollinare in Classe, one of the best preserved Early Byzantine basilicas, which was designed using the same proportional system frequently found in church plans in Asia Minor. See also F. W. Deichmann, Ravenna. Geschichte und Monumente (Wiesbaden 1969) pp. 235–261; idem, Zu den Proportionen der Grundrisse einiger ravennatischer Basiliken, in: Röm. Quartalschr. 57 (1962) p. 446 f.; P. Mazzotti, La basilica di Sant' Apollinare in Classe (Vatican City 1954); idem, S. Apollinare in Classe, indagini e studi degli ultimi trentanni, in: Riv. Arch. Crist. 62/1–2 (1986) pp. 199– 219; G. Cortesi, Classe paleocristiana e paleobizantina (Ravenna 1980) pp. 39–86.

[19] H. Buchwald, Geometry of Middle Byzantine Churches (as in fn. 16) for a discussion of Platonic and Pythagorean harmonic numeric ratios in Early Byzantine architecture and further references.

[20] See fn. 1 for Sardis EA and fn. 4 for Ayatekla No. 1; Hellenkemper dates the building about 375, while Mango believes that it may have been built in the late 5th century.

[21] H. C. Butler, Architecture and other Arts (New York–London 1904) pp. 34–36.

[22] See fn. 18.

[23] Most basilicas built using the complete system of proportions are dated without firm evidence. See fn. 24 for examples which reasonably may be dated to the 5th or 6th centuries.

[24] Simple aisled basilicas which may be dated reasonably to the 5th or 6th centuries include Kydna phase 1, Letoon East and the "Great" Church in Miletus. See fn. 7, 8, 9 for references.

[25] H. Buchwald, Geometry of Middle Byzantine Churches (as in fn. 16) for the Neoplatonic

for some architects the system may have had a special meaning, or may have been used as a guarantee of beauty, for others its components may have been no more than a welcome, useful rule of thumb.

In several churches the proportional relationships were adjusted to meet special constraints. For instance, Table 1 shows that the nave of Binbirkilise No. 1 is much narrower than in other churches of similar length; the nave width was apparently constricted by the span of the barrel vault[26]. The "classical" proportional solution, which was common in other, smaller Binbirkilise churches was altered by using the proportions 1:4 for the nave and 1:2 for aisles together with the nave. Here alternative proportions were preferred over a solution without proportions. In Didyma the dimensions of the church were adjusted to those of the *adyton* of the Temple of Apollo, into which it was constructed[27]. Because the location of the exterior flanking walls was controlled by features of the temple, the architect chose the ratio 1:2 for both the width of aisle to width of nave, and for the width to length of the entire church including the narthex, but neglected the proportions of the nave, apparently to increase its capacity by obtaining greater length. When constructing the basilica inside the temple in Aphrodisias the location of the exterior walls on the north, south and east were fixed by pre–existing features[28]; some temple forms were changed with considerable engineering and construction effort, and the architect succeeded in proportioning the nave 1:3, the nave and aisles together 3:5, and the entire church without the narthex 1:2.

While the ratios of Tables 3 and 4 were probably used in the same form by the architects who designed the basilicas, those of Tables 5 and 6 represent only a convenient method of comparing the dimensions of the intercolumniations with those of the nave lengths. The list is limited to churches for which the nave colonnade intercolumniations are reasonably secure and makes no attempt to be complete. The dimensions, measured from plans, are approximate but the resulting ratios are revealing. With a few exceptions the ratio, intercolumniation to length of nave tends to be greater as the length of the nave increases, reflecting the fact that the intercolumniation is relatively constant regardless of the length of the nave. Except in the very largest and smallest basilicas, the column spacing was not adjusted to the length of the building. The (approximate) intercolumniation 2.50 m. for instance, occurs in naves 12.50 m., 15.50 m., 29.40 m. and 35.20 m. long. Intercolumniations over 3.00 m. are rare, but occur in naves ranging in length from 20.00 m. to 55.00 m. Few churches have intercolumniations less than 2.50 m.

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background which may possibly explain the use of harmonic musical ratios in Early Byzantine buildings.

[26] See fn. 13 for references with descriptions of the church. Much greater spans were achieved in other parts of Asia Minor. See H. Buchwald, The Church of St. John the Theologian in Alasehir (Philadelphia), in: Jahrb. Österr. Byz. 30 (1981) p. 315, for a discussion of the spans of vaulted monuments in Early Byzantine buildings in western Asia Minor and elsewhere.

[27] See fn. 12 above for references with floor plan and description of the church.

[28] R. Cormack, The Temple as the Cathedral (Aphrodisias Papers, ed. by C. Roueché and K. T. Erim), in: Journal of Roman Archaeology, Suppl. Ser. No. 1 (1990) pp. 75–88.

and only the smallest less than 2.40 m. Excluding the very smallest and largest basilicas, generally intercolumniations range between 2.40 m. and 3.10 m. The conclusion may be drawn that there was a rule of thumb stating that normally columns were spaced between 8 and 10 Byzantine feet apart, whatever the exact length of the foot used may have been[29].

Our observations concerning the intercolumniation of simple aisled basilicas are also relevant to other basilica types. A comparison of the ratios in Table 5 with those of Table 6 shows that usually those of other basilica types are similar to the ratios in Table 5 for simple aisled basilicas of roughly the same length.

Several dimensions are surprising. For instance, the intercolumniations in Binbirkilise Nos. 5 and 7 are among the greatest, even though both are vaulted[30]. The greater loads supported by the columns in vaulted basilicas were not reflected in the size of the intercolumniation. In both churches there are five columns in each colonnade; with six columns a smaller intercolumniation between 2.60 m. and 2.70 m. could have been achieved, entirely in the range of normal intercolumniations in the region. The same is true in the basilica in Gülbahce, which was not vaulted; it has 5 columns about 3.20 m. on centers[31]. With six columns the intercolumniation would have been about 2.74 m. We must therefore conclude that in these cases, the number of columns was probably chosen based upon aesthetic considerations. Greater intercolumniations provide a more open, lighter, and more elegant character. The lack of sufficient reliably dated examples of simple aisled or other basilicas in Asia Minor prohibits even speculation concerning when, within the Early Byzantine period, the wider column spacing was considered to be desirable.

However, aesthetic or other choices in column spacing were limited. Normally only two viable options were at hand. In the above examples in Binbirkilise and Gülbahce, for example, fewer columns would have led to unacceptable intercolumniations over 3.70 m., and if seven columns had been used the intercolumniations would have been between 2.30 m. and 2.40 m., too small for buildings of this size according to our Tables 5 and 6. Other examples lead to similar conclusions. In the church at Didyma (eight columns 2.84 m. on centers) a solution with less columns provides intercolumniations at the upper limit, 3.20 m.; nine columns about 2.56 m. on centers would be possible, but ten columns about 2.32 m. on centers would have been unacceptable.

In the largest churches the greatest number of choices concerning column spacing were available, while in the smallest there was no choice at all. In Hieropolis No. 1 (13 columns 2.50 m. on center) the smallest possible intercolumniation was

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[29] Dimensions of the Byzantine foot are discussed extensively in M. Restle, Studien zur frühbyzantinischen Architektur Kappadokiens vol. I (as in fn. 17) pp. 89–135 with numerous references to other investigations.

[30] See fn. 13 above, particularly W. Ramsay and G. L. Bell, The Thousand and One Churches, pp. 65–70, 83–86.

[31] G. Weber, Basilika und Baptisterium in Gül-bagtsche (bei Vurla), in: BZ 10 (1901) pp. 568–573.

chosen[32]; the two other viable choices would have been 12 columns about 2.70 m. on center, or 11 columns about 2.90 m. on center. We can only speculate concerning why the smallest viable intercolumniation may have prevailed: the greater number of columns in the nave colonnade would make the nave *appear* to be longer; structural timidity should probably be ruled out, because all of the viable intercolumniations were probably considered to be structurally sound. At the opposite end of the scale, in Binbirkilise No. 16 (2 columns 2.40 m. on center) no other solution could have been found without seriously overstepping the limitations reflected in our Tables 5 and 6.

The ratios in Tables 5 and 6 provide an overview concerning the number of columns in churches of different lengths. The second digit of the ratio provides the number of intercolumniations, which is one more than the number of columns. The tables also provide useful aid in determining the intercolumniation of a basilica in which tangible field evidence is lacking. The church with unknown intercolumniation may be compared with others in the table with similar nave lengths. The ratios IC:NL of the other churches provide the probable number of intercolumniations. The column spacing may be determined by dividing the clear length of the nave colonnade by the number of intercolumniations. As outlined above, however, in some cases two or even three alternatives must be considered.

The method of determining column spacing in Early Byzantine basilicas, identified here in Asia Minor, represents a radical departure from the design methods used in monumental buildings of the previous period. In Classical temples and other buildings each dimension was carefully adjusted to be in harmony and in scale with each other dimension. In Classical temples determining one of the most important dimensions independent of the building's size would have been unthinkable[33].

C. Mango has outlined that during the Constantinian period there was a severe shortage of architects, and that the Christian basilica "was easy to construct and provided maximum effect for minimum effort..."[34]. I believe that these two observations can be seen within a causal relationship. If many buildings were required, without sufficient qualified personnel to design (and build) them, then a mass-produced building system had to be devised which was easy to design and build[35].

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[32] P. Verzone, Hierapolis (Phrygia), in: Reallexikon z. byz. Kunst 3 (Stuttgart 1967) col. 1220 f, dates phase 1 to the 5th century; see also idem, Le Campagne 1960 e 1961 a Hirapolis di Frigia, in: Annuario Scuola Archeol. Atene 39–40, n. s. 23–24 (1961–62) pp. 639–641; idem, Hierapolis cristiana, in: Corsi di cult. sull'arte rav. e biz. 12 (1965) pp. 624–627.

[33] H. Buchwald, The First Byzantine Architectural Style, Evolution or Revolution?, in: Jahrb. Österr. Byz. 32/5 (1983) = Akten XVI. Internationaler Byzantinistenkongress II/5, pp. 33–45 for further differences between Early Byzantine basilicas and the architecture of the previous period.

[34] C. Mango, Byzantine Architecture (as in fn. 2) pp. 35, 40.

[35] In "The First Byzantine Architectural Style, Evolution or Revolution?" (as in fn. 33) I attempted to demonstrate that the style of these buildings is, in many respects, radically

It is abundantly clear that the design methods demonstrated above in Asia Minor made the mass–production of Christian basilicas even easier. With minimum design expertise a basilica could be laid out in plan using a ready–made system of proportions and a rule of thumb for the intercolumniations. It seems to me that, using the design tools identified in this paper, the production of the plan of a simple aisled basilica becomes so easy that an architect, in our sense of the term, was not required. The necessary procedures could easily have been known and carried out either by the churchmen for whom the basilicas were constructed, or by the head of the work–crew.

On the other hand, I have already pointed out that the transept solutions in the two major churches in Perge required architectural decisions[36]. Numerous basilicas in Asia Minor have transepts, flanking chambers or both organized in a complex, non–standard manner which must have required careful thought and architectural expertise. It must have been architects, and very good ones, who were responsible for the design of the sophisticated vaulted spaces and the rich variety of floor plans which were produced particularly in Asia Minor, probably by the late 5th century[37].

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new and of great spacial and architectural interest. I do not believe that structural and constructional simplicity alone were the generating forces in the creation of that style. As often in architectural history, numerous aspects came together to create a successful new style, and no single impact should be overemphasized.

[36] Cf. p. 23 above.

[37] See H. Buchwald, Western Asia Minor as a Generator of Architectural Forms in the Byzantine Period, Provincial Back–wash or Dynamic Center of Production?, in: Jahrb. Österr. Byz. 34 (1984) pp. 199–234; idem, The Church of St. John the Theologian in Alasehir (as in fn. 26) pp. 301–318, for examples and discussion. The Second Architectural Style was generated by architects, obviously with the support of their clients, competing with each other with designs of great variety, ingenuity and daring; the new style may, perhaps, be understood as a reaction to the rather uniform solutions described in this paper, and to the uncreative methods utilized in their design.

Table 1.
Approximate Dimensions of Selected Simple Aisled Basilicas in Asia Minor

No.	*Description*	*Nave L (int.)*	*Nave W (int.)*	*Total L (ext.)*	*Total W (ext.)*
1.	Pisidian Antioch	42.13	11.80	—	—
2.	Xanthos East	37.00	12.80	51.00*	28.00
3.	Hierapolis Hypostyle No.1	35.20	11.50	50.00*	25.80
4.	Corycus No. 1	32.20	9.00	42.00*	20.20
5.	Assos Gymnasium	29.40	11.04	41.10*	22.50
6.	Sardis EA	29.05	9.55	40.93*	21.09
7.	Binbirkilise No. 1	27.40	6.70	37.50*	15.30
8.	Assos S of Gymnasium	27.00	9.50	37.50*	19.50
9.	Didyma Adyton	25.82	6.72	35.01*	16.38
10.	Andriaki B	23.70	6.70	29.50	17.70
11.	Knidos C	21.90	7.20	30.40*	15.20
12.	Andriaki D	21.20	7.00	26.90	16.80
13.	Pergamum Lower Agora	20.50	6.50	29.20*	14.40
14.	Binbirkilise No. 7	19.00	5.90	29.00*	15.00
15.	Binbirkilise No. 5	18.60	5.10	29.40*	14.00
16.	Miletus Great Church	18.00	7.30	28.50*	14.00
17.	Kydna Phase 1	17.73	6.08	21.47	14.10
18.	Letoon East	17.50	6.20	23.50	12.00
19.	Binbirkilise No. 29	16.40	4.40	25.10*	12.50
20.	Binbirkilise No. 3	15.40	5.10	24.60*	14.00
21.	Sura Valley	15.30	5.60	23.40*	13.50
22.	Binbirkilise No. 21	14.90	4.15	20.10	13.20
23.	Binbirkilise No. 4	10.20	4.40	18.20*	11.00
24.	Binbirkilise No.16	7.40	2.70	16.20*	9.50
25.	Binbirkilise No.31	5.50	1.80	11.70*	6.30

* Includes narthex

Table 2.
Approximate Dimensions of Selected Large Basilicas in Asia Minor

No.	*Description*	*Nave L (int.)*	*Nave W (int.)*	*Total L (ext.)*	*Total W (ext.)*
1.	Ephesus St. Mary's	74.51	12.67	94.90*	15.30
2.	Ayatekla No. 1	55.00	18.80	76.50*	38.20
3.	Aphrodisias Temple	47.50	15.00	62.00*	29.00
4.	Uzuncaburç Temple	31.00	9.00	43.20*	20.00
5.	Perge A	30.00†	10.50	51.00	33.00
6.	Perge B	22.80†	11.20	47.70*	32.10

* Includes narthex
† Excludes transept

Table 3.
Proportional Relationships in Selected Simple Aisled Basilicas in Asia Minor

No.	*Description*	*Nave W:L*	*Aisle W:L*	*N+A W:L*	*A:N W:W*	*Narthex W:L*
1.	Sardis EA	1:3	1:6	2:3	1:2	1:4
2.	Pergamum Lower Agora	1:3	1:6	2:3	1:2	1:4
3.	Assos S of Gymnasium	1:3	1:6	2:3	1:2	...
4.	Hierapolis Hypostyle 1	1:3	1:6	2:3	1:2	1:5
5.	Knidos C	1:3	...	2:3	1:3	1:4
6.	Kydna Phase 1	1:3	1:6	...	1:2	...
7.	Letoon East	1:3	...	2:3	1:3	...
8.	Arneai B	1:3	...	2:3	1:3	...
9.	Binbirkilise No. 5	1:3	1:6	2:3	...	1:3
10.	Binbirkilise No. 7	1:3	1:5	2:3	...	...
11.	Binbirkilise No. 36	1:3	1:5	3:4	1:2	...
12.	Xanthos East	1:3	1:6	3:4	1:2	...
13.	Binbirkilise No. 3	1:3	1:5	4:5	2:3	1:3
14.	Binbirkilise No. 16	1:3	1:4	1:1	3:4	...
20.	Didyma Adyton	...	1:8	3:5	1:2	...
15.	Binbirkilise No. 1 (A)	1:4	1:8	(1:2)	1:2	...
16.	Binbirkilise No. 4	1:2	1:6	...	1:2	...
17.	Assos Gymnasium	2:5	1:6	3:4	1:2	...
18.	Miletus Great Church	2:5	...	4:5	3:7	...
19.	Binbirekilise No. 32	2:5	1:7	1:1	(2:3)	...
21.	Binbirkilise No. 21	...	1:5	3:4	3:4	...
22.	Pisidian Antioch	...	...	(1:2)	1:2	1:3
23.	Binbirkilise No. 34	...	...	1:1	...	...
24.	Andriaki D	...	...	...	1:2	...
25.	Corycus No. 1	...	...	...	1:2	1:4

( ) denotes that the ratio is close enough to assume that it was intended.

Table 4.
Proportional Relationships in Selected Other Basilicas in Asia Minor

No.	*Description*	*Nave W:L*	*Aisle W:L*	*N+A W:L*	*A:N W:W*	*Narthex W:L*
1.	Ayatekla No. 1	1:3	1:6	2:3	1:2	1:6
2.	Perge A	1:3*	1:6*	2:3*	1:2	...
3.	Corycos No. 2	1:3*	...	2:3*	1:2	...
4.	Milets St. Michael's	1:3	...	2:3	1:3	1:3
5.	Aphrodisias Temple	1:3	1:9	3:5	1:3	1:5
6.	Perge B	1:3*	...	...	(1:1)	...
7.	Perge A	1:2	...	...	(1:1)	...

* Excludes transept

( ) denotes that the ratio is close enough to assume that it was intended.

Table 5.
Dimensional Rations in Selected Simple Aisled Basilicas in Asia Minor

No.	*Description*	*Nave Length (NL)*	*Inter-columniation (IC)*	*IC:NL*
1.	Hierapolis No. 1	35.20	2.50	1:14.1
2.	Corycus No. 1	32.20	2.55	1:12.6
3.	Assos Gymnasium	29.40	2.50	1:11.8
4.	Binbirkilise No. 1	27.40	2.70	1:10.1
5.	Didyma Adyton	25.82	2.84	1:9.1
6.	Binbirkilise No. 7	19.00	3.10	1:6.1
7.	Binbirkilise No. 5	18.60	3.10	1:6.0
8.	Miletus Great Church	18.00	2.60	1:6.9
9.	Döşembe A	17.80	2.60	1:6.8
10.	Kydna Phase 1	17.73	2.48	1:7.1
11.	Binbirkilise No. 29	16.40	2.70	1:6.1
12.	Binbirkilise No. 3	15.50	2.50	1:6.2
13.	Binbirkilise No. 21	14.90	2.90	1:5.1
14.	Binbirkilise No. 36	13.50	2.60	1:5.2
15.	Binbirkilise No. 34	12.50	2.50	1:5.0
16.	Binbirkilise No. 42	12.00	2.30	1:5.2
17.	Binbirkilise No. 4	10.20	2.40	1:4.3
18.	Binbirkilise No. 15	9.60	2.20	1:4.4
19.	Binbirkilise No. 16	7.40	2.40	1:3.1
20.	Binbirkilise No. 32	5.50	2.00	1:2.8

* Includes narthex
† Excludes transept

Table 6.
Dimensional Ratios in Selected Basilicas in Asia Minor

No.	*Description*	*Nave Length (NL)*	*Inter-columniation (IC)*	*IC:NL*
1.	Ayatekla No. 1	55.00	3.43	1:16.0
2.	Perge A	28.50	2.50	1:11.4
3.	Gülbahçe	20.00	3.20	1:6.3
4.	Miletus St. Michael's	17.40	2.41	1:7.2

Note: Ayatekla Church No. 1 intercolumniation is calculated by dividing the total nave length by 16, the number of intercolumniations, contradiciting E. Herzfeld, Meriamlik 17, who states that the clear span between columns is 4.60 m.
* Includes narthex
† Excludes transept

V

WESTERN ASIA MINOR AS A GENERATOR OF ARCHITECTURAL FORMS IN THE BYZANTINE PERIOD, PROVINCIAL BACK-WASH OR DYNAMIC CENTER OF PRODUCTION?

With twelve plates

For Professor Otto Demus

Throughout history Asia Minor seems to have played a double role. At times it was merely a bridge between Europe and Asia, a transmitter of forms and ideas. At other times it created new and powerful forms and ideas of its own with long lasting consequences not only for Asia Minor itself, but also for numerous other regions. The importance of Asia Minor in the development of various aspects of Classical Greek art and architecture, thought and civilisation, for instance, can hardly be overestimated[1].

It is this double role which Asia Minor seems to have played throughout history which makes the investigation of Byzantine forms there all the more intriguing. Although Asia Minor is generally recognized as one of the mainstays of Byzantine civilisation, and in spite of the fact that a great number of interesting and important Byzantine architectural monuments has been recorded there, to my knowledge no attempt has been made to organize the available material or to assess it in terms of the total development of Byzantine architectural forms[2].

Because of the lack of adequately studied monuments it is premature to attempt a definitive assessment of Byzantine architectural forms in Asia

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[1] This paper is an expanded version of a lecture held at Dumbarton Oaks in February 1983. I am grateful to Prof. Giles Constable, Director, for inviting me to present the lecture.

[2] F. W. DEICHMANN, Versuch einer Darstellung der Grundrißtypen des Kirchenbaues in frühchristlicher und byzantinischer Zeit im Morgenlande auf kunstgeographischer Grundlage. Halle 1937, defines architectural types common in Asia Minor and relates them to the broad context of the Byzantine development. R. KRAUTHEIMER, Early Christian and Byzantine Architecture. 2nd ed. extensively revised. Harmondsworth 1975, devotes portions of several chapters to Asia Minor but makes broad definitive statements concerning the forms found there and their relationship to other Byzantine architectural forms which are frequently without adequate substantiation and without an evaluation of alternative possibilities. See also the critical reviews of F. W. DEICHMANN, *BZ* 65 (1972) 102ff. and H. HALLENSLEBEN, *BZ* 66 (1973) 120ff.

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Minor. Nevertheless, in order to obtain a more complete understanding of Byzantine architecture in Asia Minor it seems imperative to commence with such an assessment, with the full awareness of the tentative and at times perhaps hypothetical nature of the results. Even though many of the observations made below may be altered, revised, or rejected in the future, I believe that they will have been of value if they have stimulated further thought and investigation concerning topics which are obviously important for any evaluation of the development of Byzantine architectural forms. The title of this paper poses a question which must be close to the heart of any attempt to relate the architectural production of Asia Minor during the Byzantine period to the broad context of Byzantine architecture. Taken at its face value the question may probably be answered simply and accurately by the statement that Asia Minor was *both* a provincial back-wash *and* a dynamic center of production. However, the question becomes far more interesting and infinitely more difficult to answer if we ask further, when and with respect to which forms either the term *provincial* or the term *dynamic* may be applicable.

In order to gain greater precision concerning the provincial and the dynamic aspects of Byzantine architecture in western Asia Minor I will discuss the available material in terms of four distinctive architectural styles even though, as in all attempts to define stylistic developments, certain monuments or even groups of monuments may not lend themselves to neat categorization. Recent summaries of the development of Byzantine architecture have presented the monuments in terms of building types, geographical localization, or the reigns of specific emperors and dynasties. I believe that it is more useful, in an investigation which focuses upon architectural forms, initially to regard the material in terms of the forms themselves; only after basic considerations concerning the forms have been identified can an attempt be made to effectively relate the forms to the social, economic, dynastic, or other political developments in the history of Byzantine civilisation. A neutral nomenclature not encumbered by traditional connotations is therefore more appropriate than the nomenclature which is usually applied to Byzantine architecture, which is based upon preconceived dynastic or other political events. I have attempted to identify those stylistic currents, in the following discussion, which will be most useful in shedding light on the problems to be resolved; other stylistic currents and sub-currents may certainly also be identified in the broad context of Byzantine architectural forms in Asia Minor and elsewhere[3].

[3] See also my comments on the question of Byzantine architectural style in The First Byzantine Architectural Style: Evolution or Revolution? *JÖB* 32/5 (1982) 33ff.

1. The First Byzantine Architectural Style

The dominant characteristics of the 1st Byzantine architectural style are the use of easily defined, simple and discreet geometric forms and spaces which are additively combined according to underlying principles of interdependence, hierarchical importance, and bi-lateral symmetry. Repetitive, anonymous features, diaphanous spacial effects, and a phenomenon I have termed the "lense effect" are also common. Basic solutions demonstrate an immediacy and a directness in the approach to the resolution of architectural problems which must also be considered an important characteristic of the style. Although the most typical building type of the 1st Byzantine architectural style is the aisled basilica, centralized buildings fit just as neatly into the same stylistic context.

Because I have outlined the characteristics of the 1st Byzantine architectural style more completely elsewhere[4], and because the evidence in Asia Minor will be the object of another investigation I will limit my comments here to a few brief and preliminary observations.

The 1st Byzantine architectural style seems to have been richly represented in western Asia Minor. However, at present neither archaeological nor historical evidence indicates that Asia Minor was important in formulating its vocabulary or its approach to resolving architectural problems. At present there is no reason to believe that Asia Minor gave strong impetus to any aspect of the 1st Byzantine architectural style. For the most part the forms which are known there can be found, with relatively minor variations, in numerous other localities in the Mediterranean basin. While local characteristics may, of course, be determined in Asia Minor as elsewhere, an important quality of the 1st Byzantine architectural style seems to be an overriding *internationalism* which tends to underplay the historic differences between locations hundreds and even thousands of miles apart.

Church EA in Sardis, one of the few aisled basilican churches in western Asia Minor for which relatively firm chronological evidence exists provides a case in point. Built perhaps around the middle and probably no later than the late 4th century, originally it had a projecting apse, an undivided narthex, and no pastophories. The apse is circular on the exterior and is flanked by large, poorly integrated buttresses. Doors led into the church not only from the west, but also from the north and east and may also have existed in the unexcavated south wall. Unfortunately little remains but the

[4] *Ibid.* 34–45.

floor plan at ground level and a few architectural and decorative details (Fig. 1–2)[5].

Very similar floor plans with only minor variations, primarily of scale, proportion, and detailing are found in numerous other churches in western Asia Minor, and this plan type therefore appears to be typical there[6]. However, the same plan, with relatively minor variations is equally typical of a number of other regions. It is found frequently in mainland Greece and on the Greek islands[7], in the southern Balkans[8], in Italy[9], and occasionally in the Holy Land[10], North Africa[11], and Corsica[12].

Santa Sabina, built early in the 5th century, is today the earliest reasonably well preserved church with a similar plan in Rome[13]. Other churches with similar plans, which are not as well preserved also exist in Rome and its vicinity, for instance the church of S. Ippolito all'Isola Sacra,

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[5] H. Buchwald, The Early Christian Basilica EA and Church E, in: Sardis from Prehistoric to Roman Times. Cambridge, Mass. 1983. 196ff., with further references; idem, The Churches of Sardis, in the series *Archaeological Exploration of Sardis*. Cambridge, Mass. (in production).

[6] Deichmann, Grundrißtypen 12 and *passim* provides a brief summary which must now be revised and expanded. An adequate nomenclature for this plan type and its variants has not as yet been proposed.

[7] *Ibid. passim*; A. K. Orlandos, Βασιλική, I. Athens 1952 *passim*; G. Sotiriou, Αἱ παλαιοχριστιανικαὶ βασιλικαὶ τῆς Ἑλλάδος. Ἀρχαιολ. Ἐφημερίς 1929, 161ff.; J. Koder, Hellas. *RbK* II. Stuttgart 1967, 1121ff.; I. Travlos, Athen, *ibid.* 349ff.

[8] H. F. Hoddinott, Early Byzantine Churches in Macedonia and Southern Serbia. London-New York 1963 for a partial survey; also W. Sas-Zaloziecky, Die byzantinische Baukunst in den Balkanländern und ihre Differenzierung unter abendländischen und islamischen Einwirkungen. Munich 1955; V. Condić and V. Popović, Caricin Grad. Belgrade 1977, 86ff.; J. Wiseman and D. Mano-Zissi, Excavations at Stobi, 1970. *American Journal of Archaeology* 75 (1971) 395ff.; B. Aleksova and C. Mango, Bargala: a Preliminary Report. *DOP* 25 (1971) 265ff.

[9] F. W. Deichmann, Frühchristliche Kirchen in Rom. Basel 1948, *passim*; R. Krautheimer, S. Corbett, W. Frankl, Corpus basilicarum christianarum Romae, *passim*; M. Marzotti, Il nuovo complesso paleocristiano della "Casa Bianca" nella zona di Classe. *XV Corso di Cultura sull' Arte Ravennate e Bizantina* (1968) 217ff.; A. Rusconi, La basilica di S. Maria di Compulteria presso Alvignano. *XIV Corso di Cultura sull' Arte Ravennate e Bizantina* (1967) 323ff.; G. Bovini, I piu antichi edifici cristiani di culto di Grado. *XX Corso di Cultura sull' Arte Ravennate e Bizantina* (1973) 123ff.

[10] Deichmann, Grundrißtypen 12ff. and *passim*; A. Ovadiah, Corpus of the Byzantine Churches in the Holy Land. Bonn 1970, *passim*; J. W. Crowfoot, Churches at Jerash. *British School of Archaeology in Jerusalem, Supplementary Papers* 3. London 1931, 16ff.

[11] Deichmann, *ibid.*; S. Gsell, Les monuments antiques de l'Algérie. Paris 1901, *passim*.

[12] G. Moracchini, Les fouilles de Saint-Jean de Corte (Corse) en 1956 et 1958. *Cahiers Archéologiques* 11 (1960) 185ff.

[13] Krautheimer, Corbett, Frankl, *ibid.* IV (1970) 72ff.

which may be dated to roughly the same period as church EA in Sardis[14]. There is no necessity, therefore, to believe that church EA was built earlier than similar buildings in the capital, and perhaps also in other parts of the empire. Indeed, the plan of the Constantinian basilica of the Lateran in Rome could well have been the ultimate prototype for the Sardis EA plan, which can readily be devised by removing the lateral aisles and the lateral aisle chambers from the Constantinian plan of the Lateran basilica[15]. It seems reasonable to assume that such a process of simplification would have been used to design churches built on a smaller scale and, perhaps, with a slightly different function.

The relationship between the Sardis EA floor plan and early church plans in Constantinople is at present even less clear. The earliest firmly dated church with a similar floor plan of which significant remains are known is Saint John of the Studion, built shortly after the middle of the 5th century[16]. While numerous earlier churches are known there from written sources, precise information concerning their appearance must await further excavation[17]. On the other hand, important features of the Sardis EA plan, for instance the lack of pastophories or other rooms flanking the apse, and the doors in the northern and eastern walls of the side aisle have been shown to be standard in Constantinopolitan solutions of the 5th and 6th centuries[18]. While these features are certainly common to western Asia Minor and Constantinople and are now known in earlier monuments in western Asia Minor, the lack of evidence in Constantinople does not permit an attribution of priority.

The detailing of those parts of church EA in Sardis which remain *in situ* or may be attributed to the original construction phase with some probability is carefully executed with great precision, and of very high quality[19]. Moreover, the detailing is dramatically simple in conception, not to say

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[14] L. Pani Ermini and R. Giordani, Il complesso di S. Ippolito all'Isola Sacra. *Bollettino d'Arte* (1975) 192ff.

[15] R. Krautheimer and S. Corbett, The Constantinian Basilica of the Lateran. *Antiquity* 34 (1960) 201ff.; Deichmann, Frühchristliche Kirchen 11ff. emphasizes the importance of the Lateran basilica and (p. 18) assumes that simpler basilican forms may have been derived from it. Other sources are of course also possible.

[16] C. Mango, The Date of the Studius Basilica in Istanbul. *Byzantine and Modern Greek Studies* 4 (1978) 115ff., with further references.

[17] C. Delvoye, L'architecture paléobyzantine à Constantinople aux IV^{e} et V^{e} siècles. *23. Corso di Cultura sull'Arte Ravennate e Bizantina* (1976) 147ff. with further references; T. F. Mathews, The Early Churches of Constantinople. University Park and London 1977, 11ff.

[18] Idem, *passim*.

[19] Cf. fn. 5 above for detailed descriptions.

ascetic. The columns have little or no entasis and capitals are reduced to a geometric minimum almost without ornamentation (Fig. 2). The simple, pristinely geometric character of the major forms of the 1st Byzantine architectural style is therefore reflected directly in 4th century Sardis also in the architectural detailing, probably an indication that the major forms of Sardis church EA were not merely superficial imports, but rather, that they constitute one part of an extensive formal vocabulary which included many aspects of the building's forms, and which required a work crew composed of numerous specialists attuned to the same stylistic development.

Even though the available evidence is insufficient, at present, to fully evaluate the position of Asia Minor within the 1st Byzantine architectural style, buildings such as Sardis church EA can help to clarify in what sense western Asia Minor may have been provincial or dynamic at the time the style prevailed. The relatively early date of the building seems to indicate that those responsible for its construction wanted and obtained architectural forms which were current and up-to-date. While western Asia Minor may not have been a leader in the development of the 1st Byzantine architectural style, and in that sense may have been provincial, it cannot be described as a back-wash. Rather, it seems to have been an active participant in creating high quality products with consistent, high quality detailing in a style which, once it was formulated, demanded little creative ingenuity, and which gave the comfortable knowledge that the completed forms were in harmony with those of the capital and of numerous other parts of the now Christian empire.

2. The Second Byzantine Architectural Style

The position of western Asia Minor within the 2nd Byzantine architectural style is, for the most part, significantly different. In this style, which achieved its greatest masterworks during the reign of Justinian in buildings like San Vitale in Ravenna and Haghia Sophia in Istanbul, the geometry of interior spaces is far more complex, interlocking rather than neatly additive forms are prevalent, and repetitive elements are usually grouped into distinctive rhythmic units[20]. Numerous building types and principles of structure and composition were developed alternatively. Distinctive features used frequently in the 1st Byzantine architectural style were com-

[20] Cf. also Buchwald, The First Byzantine Architectural Style, 39f.; S. Guyer, Rom und die altbyzantinischen Architekturformen. *Atti del V. Congresso Internazionale di Studi Bizantini* = SBN 6 (1940) 155ff.

bined or multiplied in new ways within the same building without entirely losing their individual, recognizable forms. Frequently the 2nd Byzantine architectural style is characterized by a boldly experimental and imaginative approach which resulted in a great variety of forms.

Because of the great variety of forms produced in the 2nd Byzantine architectural style I will concentrate here on three individual tendencies or developments which are of particular interest for the evaluation of Byzantine architecture in Asia Minor. For the sake of convenience I will term them *developments A, B, and C*. While the developments may be clearly defined, I believe that they should be thought of neither as sub-styles nor as individual building types.

Development A

The first development within the 2nd Byzantine architectural style is characterized by the use of a central feature which may or may not be covered by a vault, constructed on a floor plan composed either of a regular polygon or of a combination of rectangular and circular components; the central feature is separated from an annular ambulatory space by arcaded pierced exedrae, piers, walls, or columns. Many of these buildings have received a good bit of attention, and this development seems to have had little importance in Asia Minor. Development A need therefore be described only briefly here.

The best preserved examples of development A are the churches of Saints Sergius and Bacchus in Istanbul and of San Vitale in Ravenna, both dating from the 2nd quarter of the 6th century[21]. Other examples are known in Italy, Greece, the southern Balkans, Syria, Armenia, Mesopotamia, the Holy Land, and Asia Minor[22]. The earliest extant church of this development seems to be San Lorenzo in Milan, probably constructed as

[21] C. MANGO, The Church of Sts. Sergius and Bacchus Once Again. *BZ* 68 (1975) 385ff. for the date of that church; relevant descriptions, illustrations, and references for both churches in all surveys of Byzantine architecture.

[22] E. KLEINBAUER, Zvart'nots and the Origins of Christian Architecture in Armenia. *Art Bulletin* 53 (1971) 245ff.; IDEM, Aisled Tetraconch Churches. *DOP* 27 (1973) 89–114 deals with a group of churches within development A; H. MAGUIRE, The "Half-cone" Vault of St. Stephen at Gaza. *DOP* 32 (1978) 319–25; D. DE BERNARDI FERRERO, L'edificio nell' interno della cosidetta Biblioteca di Adriano ad Atene. *22. Corso di Cultura sull' Arte Ravennate e Bizantina* (1975) 171ff.; J. B. WARD-PERKINS, The Italian Element in Late Roman and Early Medieval Architecture. *Proceedings of the British Academy* 33 (1947) particularly 172ff.; KRAUTHEIMER, Early Christian and Byzantine Architecture, 240ff., with extensive references; the written sources for the lost Octagon of Antioch, initiated by Constantine, are inadequate to attribute it to this development and the appearence of extant Constantinian church forms makes it unlikely that development A can be traced directly to Constantine.

early as the 3rd quarter of the 4th century[23], while the last examples were apparently built in the 7th century or somewhat later[24]. Development A appears in Asia Minor only in isolated examples, and none are known at present, to my knowledge, in the western coastal plains and valleys even though many of the political and cultural centers of that wealthy region have been extensively excavated. The examples which are known in Asia Minor, Corycus Church 2, and a tetra-conch building in Perge which was probably a church (Fig. 4–8, 27), are located on the south coast and may, perhaps, have been constructed under the influence of Syria, where a number of similar buildings are also known[25].

[23] A. CALDERINI, G. CHIERICI, C. CECCHELLI, La Basilica di S. Lorenzo in Milano. Milan 1951; E. KLEINBAUER, Toward a Dating of San Lorenzo in Milan. *Arte Lombarda* 13 (1968) 1ff.; IDEM, Aedita in turribus: the Superstructure of the Early Christian Church of San Lorenzo in Milan. *Gesta* 15 (1976) 1–9 with extensive references; D. KINNEY, The Evidence for the Dating of S. Lorenzo in Milan. *Journal of the Society of Architectural Historians* 31 (1972) 92ff.; A. GRABAR, Etudes critiques. *Cahiers archéologiques* 9 (1957) 345.

[24] E. KLEINBAUER, Zvart'nots, *passim*; some of the churches in Armenia may, perhaps, have been constructed later, and the church of St. Gregory in Ani, completed 998, is the product of a revival rather than of a continuous development.

[25] G. L. BELL, Notes on a Journey through Cilicia and Lycaonia. *Revue Archéologique* 4. ser., 8 (1906) 15ff. for a partial, inexact plan, illustrations, and a description of "basilica 2" in Corycus, which I would prefer to call "Corycus church 2"; E. HERZFELD and S. GUYER, Meriamlik und Korykos. Manchester 1930, 126ff. call the same church "Burial Church Outside the Walls", an awkward title based upon insufficient evidence; it was the largest church of the city and is attributed to the 6th century by the excavators; *ibid.*, 148ff. for a comparison with Syrian examples; also KLEINBAUER, Aisled Tetraconch, *passim* for further examples in Syria; G. STANZL, Längsbau und Zentralbau als Grundthemen der frühchristlichen Architektur. Vienna 1979, 85ff. provides a reconstruction of Corycus church 2 without lateral exedrae. My observations on both churches were made in 1983. The angle piers inside Corycus church 2 are finished by slender piers with carved acanthus capitals on the northern and southern sides which correspond exactly with those on the western sides of the western angle piers. The latter piers certainly supported the arches of a colonnade built on an exedral plan as shown in H. and G.'s reconstructed plan, for its foundation stylobate can still be clearly seen. It is therefore reasonable to assume that H. and G.'s reconstruction with lateral exedrae is correct. Evidence which will be presented elsewhere indicates that the northern and southern apses belong to an earlier church built on a basilican plan, and that the walls which project from the central angle piers toward the east, north, and south must be attributed to a later reconstruction. KLEINBAUER, Zwart'nots, 256 for the unexcavated and unpublished tetra-conch at Perge, which, according to K., may be pre-Constantinian. I believe that the building was probably a church because its eastern exedra is connected to the central bay by an intermediate bay, a solution frequently found in churches. Also, spoils some of which contain inscriptions are re-used in the masonry, and bricks and brick chips are used in some of the vertical joints of the ashlar masonry, both features which would be unusual in the pre-Constantinian period. The walls of the extant tetra-conch are about 1.55 m thick and are built with the extensive use of mortared rubble, perhaps indications that the building was fully vaulted. A very poorly preserved outer wall which was roughly concentric to the core of the building may be traced to the east and north of the tetra-conch.

In order to achieve a better understanding of Byzantine architecture in western Asia Minor it is appropriate to raise the question, why development A, apparently the earliest manifestation of the 2nd Byzantine architectural style, does not seem to have been used in the rich centers of the western coastal plains of Asia Minor?

It is impossible to find a definitive answer to such a question, not only because of the possible loss of the relevant monuments. Specific reasons for architectural choices are seldom provided by the written sources, and even when they are given, for instance in the architectural polemics of the past two or three generations, reasons given by architects, critics, theorists, or historians are often contradictory, incomplete, or not in compliance with the evidence provided by the architectural monuments, an observation which indicates not so much a lack of sincerity, or incompetence, but rather, that there are frequently important reasons for architectural choices which, perhaps because they appear to be self-evident, usually remain unstated. Even if written evidence were more abundant, our understanding of the reasons for architectural choices during the Byzantine period would be limited.

Any attempt to explain the apparent lack of development A buildings in the western coastal regions of Asia Minor can therefore be little more than speculation. I would, nevertheless, like to add a few observations concerning development A of the 2nd Byzantine architectural style which may, perhaps, suggest a resolution to our question.

Several attempts have been made to explain at least some of the features of development A churches functionally and symbolically, either as martyria or as palace churches[26], but these attempts have failed to provide an adequate explanation of their forms[27]. I would like to under-

[26] KLEINBAUER, Aisled Tetraconch; IDEM, Zwart'nots; W. DINES, The First Christian Palace Church Type. *Marsyas* 11 (1962–1964); KRAUTHEIMER, Byzantine Architecture, 240ff.

[27] KLEINBAUER, Aisled Tetraconch, demonstrates that not all of the churches were martyria and provides extensive references; F. W. DEICHMANN, Das Oktagon von Antiocheia: Heroon-Martyrion, Palastkirche, oder Kathedrale. *BZ* 65 (1972) 40ff.; C. MANGO, The Church of Saints Sergius and Bacchus at Constantinople and the Alleged Tradition of Octagonal Palatine Churches. *JÖB* 21 (1972) 189–93; IDEM, The Church of Saints Sergius and Bacchus, 392. Corycus church 2, located outside the city walls, is unlikely to have served either as a palatine church or as a cathedral, and the excavators found two sarcophagi near its center, leading them to the interpretation that it was a martyrium. However, this conclusion may be premature, because the church seems to have been constructed in a necropolis, and the sarcophagi could have been located under the floor of the church without the knowledge of the builders. On the other hand, the sarcophagi could also have been placed into the church during a later reconstruction. The excavation accounts are not very clear concerning the exact location or the forms of the sarcophagi.

score these arguments against a functional origin by the observation that Santo Stefano Rotonda in Rome, built as much as a century *after* San Lorenzo in Milan, with its central feature surrounded by annular ambulatory spaces would probably have performed the same tasks, functionally, as many of the churches of the group under discussion[28]. On the other hand, Santo Stefano must be described in terms of the 1st, and not the 2nd Byzantine architectural style because of its clear and simple pristine geometry and its repetitive, anonymous forms, regardless of how the outer ring of chambers or courtyards, which was additively related to the other spaces, is reconstructed. I believe that this telling comparison demonstrates two important points. First, that those characteristics of development A churches which distinguish them from comparable buildings of the 1st Byzantine architectural style are due primarily to choices made for stylistic rather than functional reasons. The pierced exedrae provide these churches with greater spacial richness and complexity, but with no apparent functional advantage. The second point is that the 1st and 2nd Byzantine architectural styles co-existed for many generations. This latter observation may, perhaps, best be explained by observing that development A owes several of its finest and most important examples, and indeed, its first relatively well dated example either to the imperial court or to circles which were, or wanted to be, closely associated with it[29]. Development A may, therefore, perhaps initially have been a "high" style, created by the court or circles close to it as a reaction against the much plainer, and somewhat more pedestrian 1st Byzantine architectural style. Once established, it could be imitated either with, or without an understanding for its origins.

If indeed the churches of development A were initially created as a "high" style by architects close to the imperial court, then the apparent lack of interest in this development in western Asia Minor may, perhaps, at least partially be explained by the further observation that this region does not seem to have been a focal point of imperial power during the period when development A flourished. While Nicomedia is an exception, monuments have not survived there. However, I believe that frequently several concurrent reasons may be useful in explaining architectural phenomena. Further reasons could have been, that there were strong preexistant architectural

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[28] KRAUTHEIMER, *Corpus* 5 (1977) 199ff. and particularly 236f.

[29] KLEINBAUER, Aisled Tetra-conch, *passim*; IDEM, Aedita in turribus; MANGO, The Church of Saints Sergius and Bacchus; KINNEY, The Evidence, particularly 101ff.; many aisled tetra-conch churches were exceptionally large and ornately decorated, indicating that they may have been built to impress the observer with the importance of the building, whatever its specific function, and with the importance of those responsible for its construction.

traditions in western Asia Minor which resisted new impulses from elsewhere, and that interest in new architectural developments there was channeled in other directions which were, perhaps, more firmly rooted in western Asia Minor.

Development B

In contrast to the development just described, the buildings of the second development within the 2nd Byzantine architectural style are found almost exclusively in western Asia Minor. They stand in stark constrast to most ecclesiastical buildings constructed throughout the history of Byzantine architecture in that their spacial organization depends primarily upon a series of equal or almost equal modular units, usually each unit being composed of a vault supported by piers on a square or nearly square plan. Also in contrast to development A of the 2nd Byzantine architectural style, the churches of development B have, on the whole, received little attention and some are all but unknown.

I have described the remains of one such building, the church of St. John the Theologian in Alaşehir, or Philadelphia in Lydia, in a recent publication[30]. Its nave was constructed of at least two very large equal bays each covered by a pendentive dome or by a dome on pendentives. Although the use of two equal units, one added to the other, is reminiscent of the additive and repetitive character of the 1st Byzantine architectural style, in St. John's the geometry of each space is not simple, discreet, and clearly defined but rather, complicated by the extensive use of plastically articulated piers with reëntrant angles which directly reflect the major arches of the vaulting zone. Because of the rich articulation of the piers the two domed units appear to overlap, producing the impression of a single space which is subdivided. The repetition which is inherent in the modular organizational principle is reduced by limiting the number of bays to a minimum, thereby avoiding the relentless rhythms associated with the arcades and clerestories of the 1st Byzantine architectural style.

Other examples of development B in western Asia Minor include church D at Sardis, which must have been constructed before the Persian devastation of the city in the early 7th century (Fig. 25)[31], the so-called Municipal

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[30] H. Buchwald, The Church of St. John the Theologian in Alaşehir (Philadelphia). *JÖB* 30 (1981) 301ff.

[31] To be published by L. Vann in: The Churches of Sardis. *Archaeological Exploration of Sardis*. Cambridge, Mass. C. Foss, Byzantine and Turkish Sardis. Cambridge, Mass. 1976, 53ff. for the destruction of the city. Also H. C. Butler, Sardis I, The Excavations, Part 1: 1910–1914. Leyden 1922, 33; G. M. A. Hanfmann, Sardis from Prehistoric to Roman Times. Cambridge, Mass. 1983, 196, Fig. 287.

Church of Hierapolis in Phrygia (Fig. 10), tentatively dated to the 2nd half of the 6th century by the excavators[32], and the church of St. John in Ephesus. The latter building is the only one of the group in western Asia Minor which is relatively well dated[33].

According to descriptions the destroyed Justinianic church of the Holy Apostles in Constantinople had the same general forms as St. John's in Ephesus[34]. The modular principle as a dominating design feature of Byzantine churches may, therefore, have been introduced by court architects in Constantinople and transplanted to Asia Minor with the construction of St. John's in Ephesus[35]. The other churches of development B in Asia Minor could then be explained as designs which transplant the modular principle from Ephesus, the metropolitan center of the region, to the simpler basilican churches of the smaller cities of the area, which may well have been stylistically dependent upon it. At first glance such a hypothesis seems plausible, and the lack of adequate chronological evidence for the churches in Alaşehir, Sardis, and Hierapolis would permit an attribution of all three buildings to the period following the construction of St. John's in Ephesus. However, the construction of both the Holy Apostles and St. John's in Ephesus is reported to have commenced in the same year, 535 or 536, and there is no reason to assume *a priori* that Constantinople took the lead in the introduction of new architectural methods and principles. Indeed, there is no precedent known at present in the capital before the 2nd quarter of the 6th century for the structural system which was used not only in all

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[32] P. Verzone, Le chiese di Hierapolis in Asia Minore. *Cahiers Archéologiques* 8 (1956) 52ff. and Fig. 17; idem, Hierapolis christiana. *XII Corso di Cultura sull' Arte ravennate e bizantina* (1956) 620ff.; idem, Hierapolis. *RbK* II (1967) 1215ff. The form of the nave vaults is uncertain; they could have been barrel vaults like those known in Armenian solutions. While the square bay plan implies that domes or domical vaults were used, Armenian barrel vaulted churches with square nave bays are also known. Remnants of the vaults may still be found in the very deep debris inside the nave.

[33] Ephesus IV–3 (1951) *passim*; G. Sotiriou, Ἀρχ. Δελτίον 7 (1921–1922); a recent summary of the history of the building is presented in C. Foss, Ephesus after Antiquity: A late antique, Byzantine and Turkish City. Cambridge 1979, 88ff. with extensive references and sources; also A. M. Schneider, *BZ* 46 (1953) 179ff.; N. Brunov, *BNJ* 6 (1927–28) 509ff.

[34] Procopius, Buildings 1–4, 9ff. for the basic text; the evidence is summarized in Krautheimer, Early Christian and Byzantine Architecture 253ff. with further references.

[35] F. W. Deichmann, Zur spätantiken Bauplastik von Ephesos. *Mansel'e Amarğan* (Ankara 1974) 549ff., for the use of capitals and perhaps also sculptors from Constantinople in St. John's in Ephesus; Foss, *ibid.* 88ff. for evidence relating the construction of the church at Ephesus to the Constantinopolitan court, and to Justinian. The imperial monograms on the capitals of St. John's permit no doubt concerning the existence of a relationship between the construction of the church and Constantinople, although the specific nature of the relationship is open to interpretation.

extant churches of development B in western Asia Minor, but also in numerous Justinianic churches in Constantinople. In western Asia Minor, on the other hand, there are a number of earlier examples of this structural system and also of distinctive details frequently used in the churches of development B[36].

At present there is a lacuna of examples of churches built on the modular principle which can be reasonably dated to the period before the 2nd quarter of the 6th century. Two churches appear to be candidates to fill the lacuna, although the evidence is admittedly fragmentary and incomplete. The church of St. Barnabas on Cyprus, which has been reconstructed with three major domes over the nave, is reported to have been built in the late 5th century[37]. While both the archaeological and the written evidence require further study, the church of St. Barnabas may, perhaps, provide a link to still other examples in western Asia Minor. With its nave solution formed by three roughly equal domed bays rather than the two bays utilized in Sardis church D and probably in Alaşehir[38], the church of St. Barnabas is related to the church built into the baths outside the city wall of Hierapolis in Phrygia, which the excavators have called the Church of the Thermae[39]. Here the hall of a late Roman bath was transformed into a vaulted basilica strongly resembling the churches of development B. The division of the nave into three equal bays was adapted directly from the original Roman hall, which was divided into three equal parts by piers. The bays are distinctly rectangular rather than square, a feature which also depends directly upon the dimensions of the original hall. However, the spacing of the church piers reduces the width of the original bays considerably, permitting a possible reconstruction with domes built on an oval plan, which were also utilized in Sardis church D and in the western cross arm of St. John's in Ephesus. On the other hand, the extant evidence is insufficient, in the church in Hierapolis, to permit more than a guess

[36] Buchwald, The Church of St. John, 316 for a brief and preliminary review of the evidence; F. Fasolo, La Basilica del Concilio di Efeso. *Palladio* ns 5–6 (1957); idem, L'architettura romana di Efeso. Rome 1962, has traced the use of this structural system in numerous Roman and early Byzantine buildings in western Asia Minor; F. W. Deichmann, Studien zur Architektur Konstantinopels im 5. und 6. Jahrhundert. Baden-Baden 1966, for the relationship between this structural system and other features to Constantinople.

[37] G. A. Sotiriou, Les églises byzantines de Chypre à trois et à cinq coupoles et leur place dans l'histoire de l'architecture byzantine. *SBN* 6 (1940) (V. Congresso internazionale di studi bizantini, Roma 1936, 2) 401ff.; idem, *Κυπριακαὶ Σπουδαί* 1 (1937); idem, Τὰ βυζαντινὰ μνημεῖα τῆς Κύπρου. Α'. Λεύκωμα. Athens 1935.

[38] The evidence in Sardis is clear and unmistakable; the western piers are not known in Alaşehir.

[39] Verzone, Hierapolis, 1212ff.; idem, Le chiese, 40ff.

concerning the form of its vaulting solution. The situation is unfortunately similar with respect to the dating of the transformation of the Roman hall into a church, which has been attributed to the period around 400 by the excavators without firm evidence[40].

Regardless of its date, not only the division of the nave into three equal bays, but also the specific form of the piers with reëntrant angles in the Church of the Thermae in Hierapolis relates its construction to building C at Sardis, the function of which has not been identified, but which may have been a large hall in a late Roman bath or gymnasium (Fig. 26)[41]. Moreover, Sardis building C was constructed with brick vaulting on ashlar piers, a system very similar to that used in all of the extant churches of development B in western Asia Minor. While building C may be only very generally dated to the 3rd or 4th centuries, its extremely neat ashlar and brickwork are clearly a good bit earlier than those of the churches under consideration.

The basic similarities in organization, structure, and details found in Sardis building C, the Church of the Thermae in Hierapolis, and in churches in western Asia Minor which we have grouped in development B may, perhaps, indicate that the genesis of our group of churches is to be sought in the large halls, frequently vaulted and divided into three roughly equal bays, which were often important or central features of late Roman baths and gymnasia. While the most magnificent examples of such halls exist in Rome, and Roman examples have been cited as influences upon the Justinianic buildings of Constantinople, excellent, if not as well preserved examples also exist in the cities of western Asia Minor[42].

Within the context of development B the relationship between western Asia Minor and Constantinople is not exhausted by the comparison between St. John's in Ephesus and the Holy Apostles. The nave of the church of St. Eirene in the capital is covered by two large domes roughly reminiscent of the solutions in Sardis church D and probably in Alaşehir[43]. Even though

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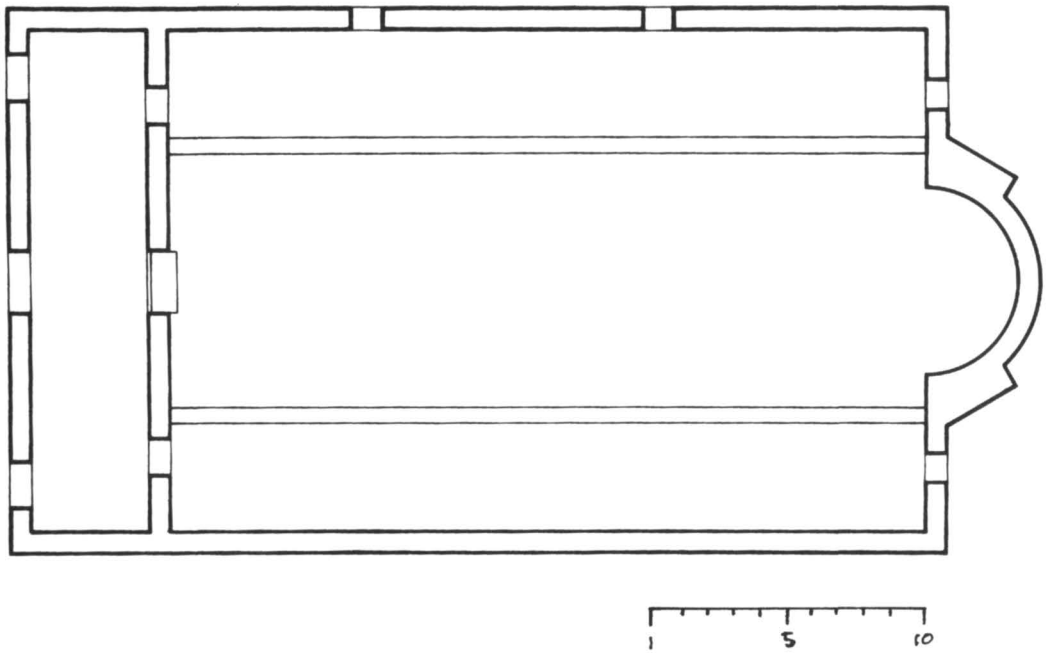
[40] IDEM, Hierapolis, 1215; IDEM, Le chiese, 59.

[41] This building will also be published by L. VANN in the series *Archaeological Exploration of Sardis*, Cambridge, Mass.; BUTLER, Sardis I part 1, 33 and Ill. 4, 18, points out that the building had been identified by travellers as a church, with a good bit of scepticism, and comments upon the excellent brickwork of the vaulting.

[42] D. S. ROBERTSON, Greek and Roman Architecture, 2nd ed. Cambridge 1943, reprint 1971, 258ff.; J. B. WARD-PERKINS, Architettura Romana. Milan 1979, 152f.; F. MILTNER, Ephesos. Vienna 1958, 32f., 43ff., 58ff., 73ff.; A. v. GERKAN and F. KRISCHEN, Thermen u. Palaestren. *Milet* I–9 (Berlin 1928); F. K. YEGUL, The Bath-Gymnasium Complex. *Sardis from Pre-historic to Roman Times* (Cambridge 1983) 148ff.

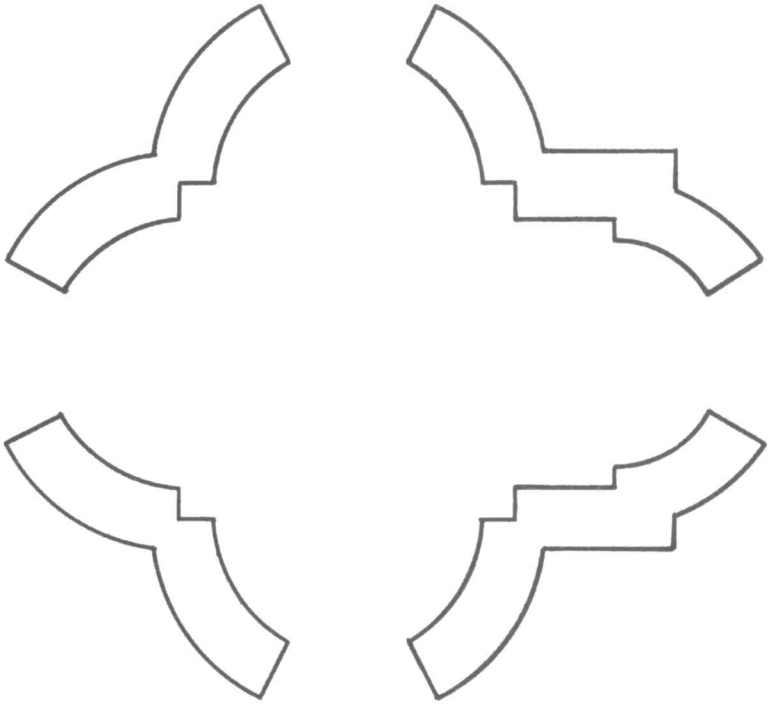
[43] W. S. GEORGE, The Church of St. Eirene at Constantinople. London 1912; U. PESCHLOW, Die Irenenkirche in Istanbul. Tübingen 1977, for an exemplary precise detailed description.



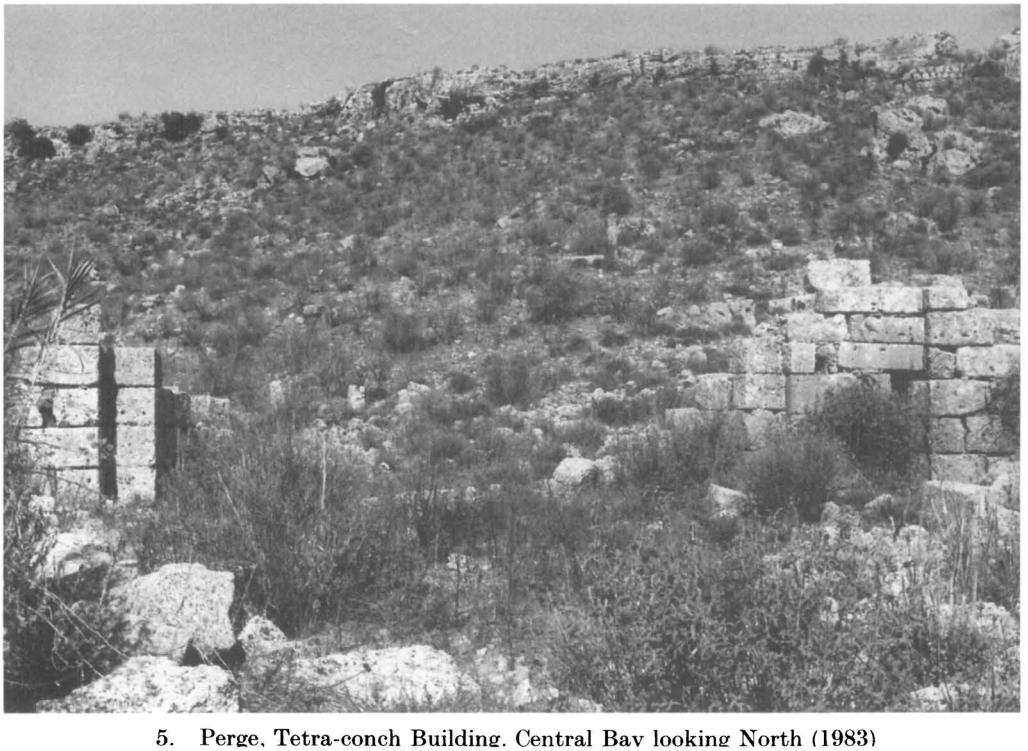
1. Sardis, Church EA. Reconstructed Plan, Phase I

2. Sardis, Church EA. Double Engaged Column in Medieval Grave (1973)

3. Ayatekla (Meriamlik), Church 2. Masonry Core of the South West Pier, South Side looking North, with Seat of an Arch at the Right (1983)

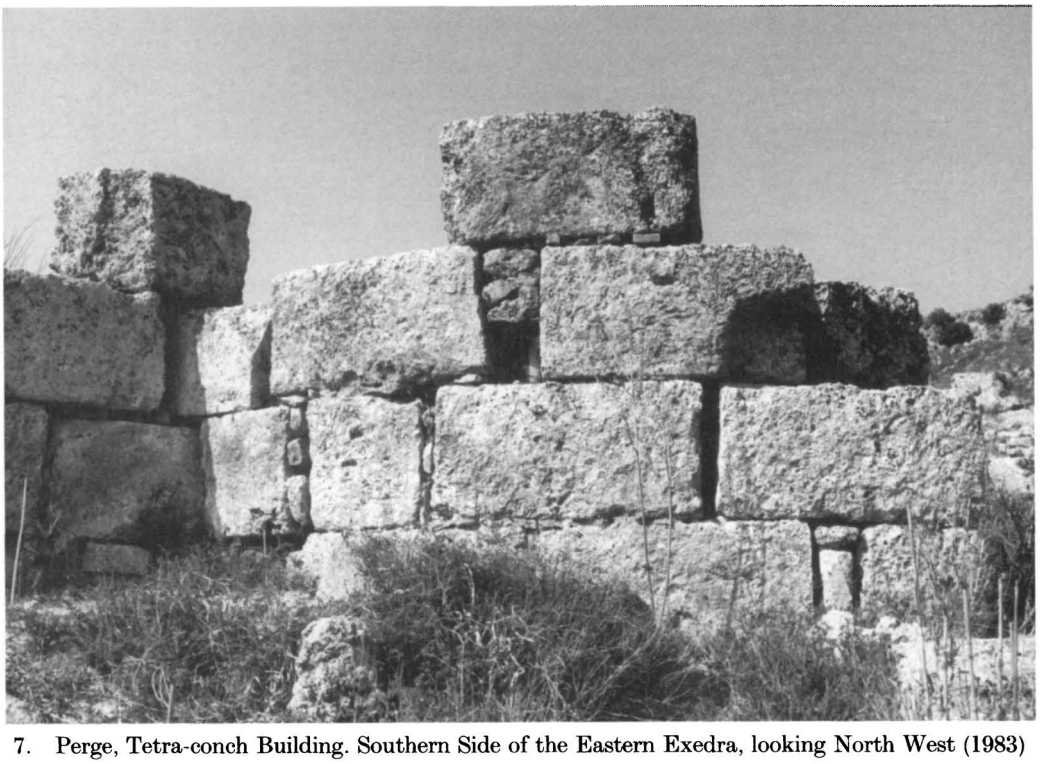


4. Perge, Tetra-conch Building. Approximate Sketch Plan of Central Walls, not to Scale



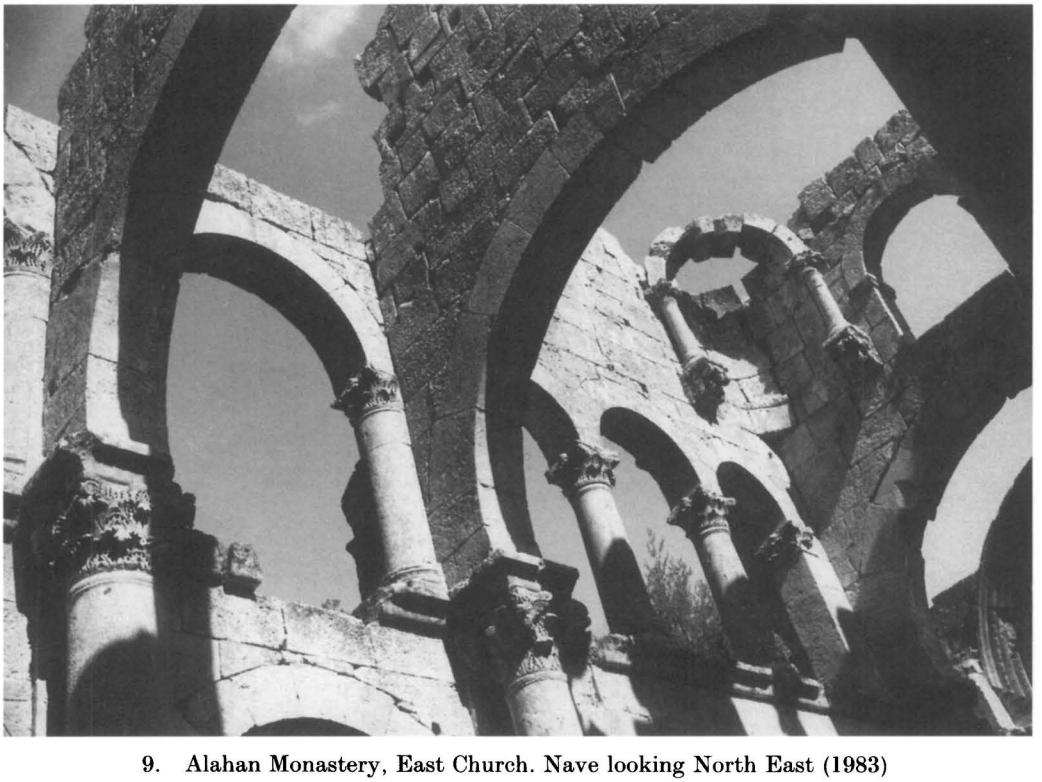
5. Perge, Tetra-conch Building. Central Bay looking North (1983)

6. Perge, Tetra-conch Building. Northern Side of the Western Exedra, looking North (1983)



7. Perge, Tetra-conch Building. Southern Side of the Eastern Exedra, looking North West (1983)

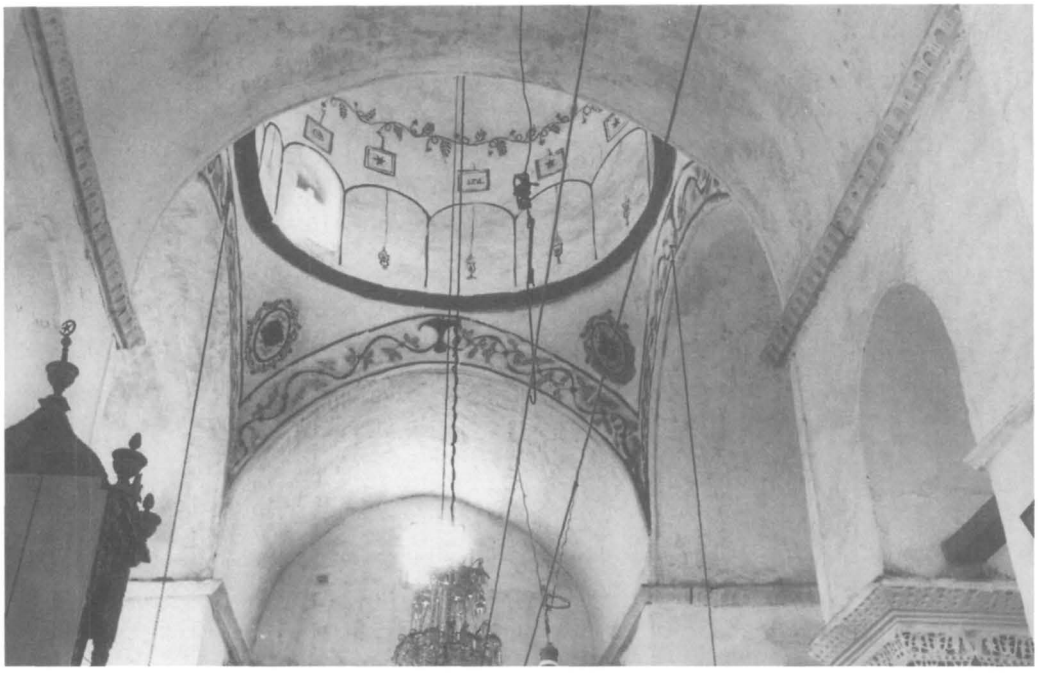
8. Corycus, Church 2. South Western Angle Pier, looking North East (1983)



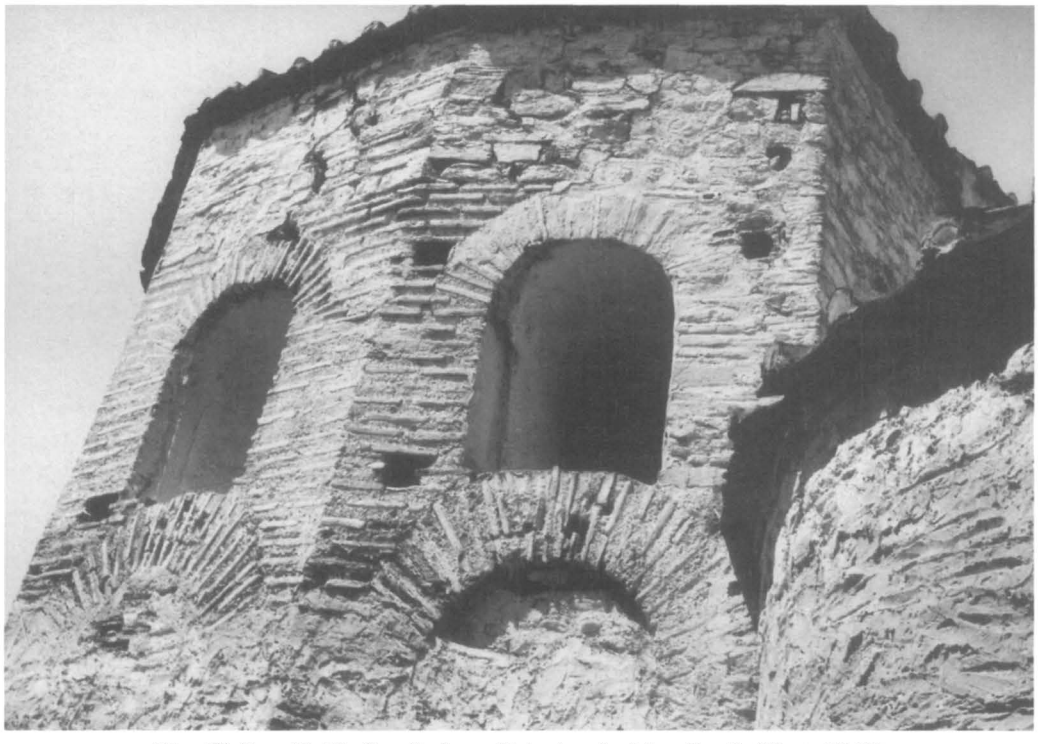
9. Alahan Monastery, East Church. Nave looking North East (1983)

10. Pamukkale (Hierapolis in Phrygia), "Municipal Church". Nave and South Transept, looking South West (1975)

11. Pamukkale (Hierapolis in Phrygia), Church Built into the Hall of a Gymnasium. Nave looking North West (1979)



12. Tirilye, Fatih Camii. Interior, looking West (1965)



13. Tirilye, Fatih Camii. Apse Exterior, looking South West (1965)

14. St. John of Pelekete. Nave, looking East (1965)

15. St. John of Pelekete. North Eastern Column, looking North (1965)

16. St. John of Pelekete. North Eastern Column, looking North East (1965)

17. Side, Chapel VI near the East Basilica. Eastern Bays, looking North (1983)

18. Side, Chapel VI near the East Basilica. Nave, looking North East (1983)

19. Side, Chapel VI near the East Basilica. Nave, looking East (1983)

20. Side, Chapel VI near the East Basilica. Apse, looking West (1983)

21. Side, Church H. Nave, looking West (1983)

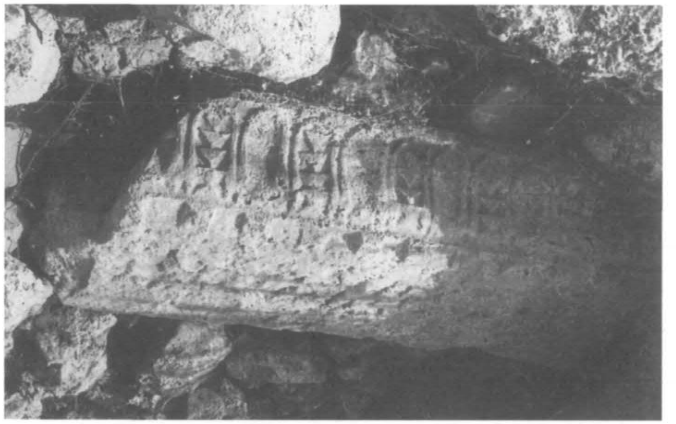
22. Side, Church H. South Facade at the South Western Bay, looking North (1983)

23. Side, Church within the South West Basilica. North East Bay, looking North (1983)

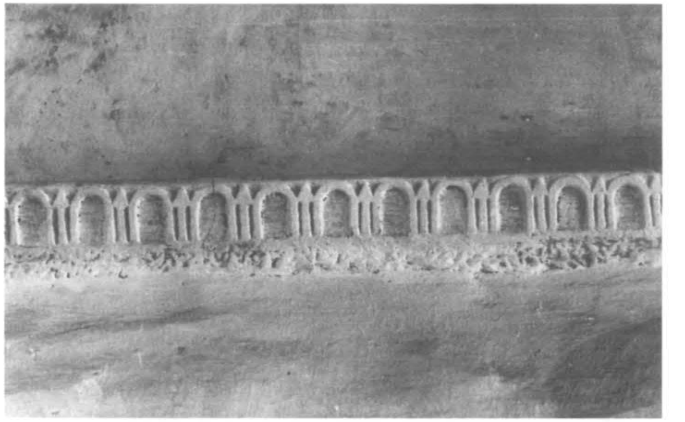
24. Side, Church within the South West Basilica. South Facade, looking North (1983)

25. Sardis, Church D. Nave Pier (1979)

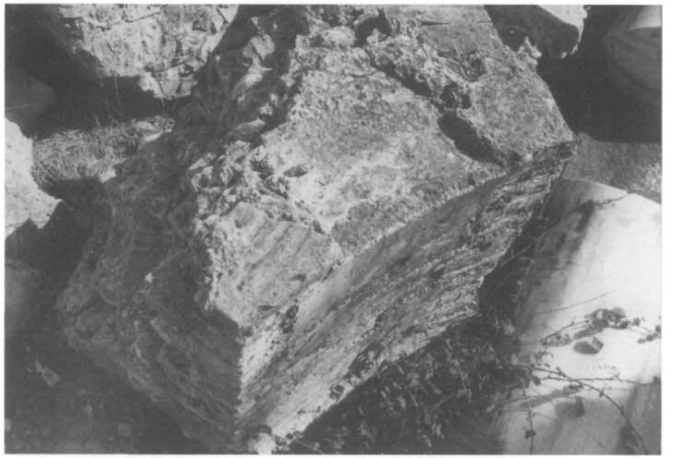
26. Sardis, Building C. Pier (1979)



27. Perge, Tetra-conch Building. Carved Lintel in the Debris near the Opening in the Eastern Exedra (1983)



28. Tirilye, Fatih Camii. Carved String Course at the Spring Line of the Major Vaults on the Southern Side of the Bema Bay (1965)



29. Side, Chapel VI near the East Basilica. Masonry Fragment in the North Aisle (1983)

30. Side, Chapel VI near the East Basilica. Masonry Fragment in the North Aisle (1983)

the western dome over the nave of St. Eirene is usually attributed to an 8th century reconstruction[44], it seems important to point out that the similarity between St. Eirene and churches of our group in western Asia Minor may not be coincidental. Disregarding, for the moment, the evidence of the masonry and of the written sources, it seems appropriate to pose the following question: Why should a solution with a second major dome over the nave have been chosen for St. Eirene in the 8th century, a time when no similar solutions are known elsewhere in Byzantine architecture, and a time when comparable solutions in Asia Minor, which had been devastated by the Persians more than a century before, are not very likely to have been of interest in the capital? It seems more likely that this solution would have been used in St. Eirene already in the 6th century, when major churches comparable in size were built using a similar vaulting solution in western Asia Minor. On the other hand, the plan of the western nave bay at ground level, with its intermediate piers, probably indicates that there was no intention to vault it with a dome when the construction of the church was initiated. Nevertheless, it seems possible that the idea of constructing a dome over the western bay may have been introduced in the course of the 6th century, perhaps under the influence of similar solutions in Asia Minor, even if further research demonstrates that the extant solution was constructed later. As we have seen, the construction of domes with similar dimensions on an elliptical plan was not unusual in 6th century Asia Minor.

The immediate impact of the churches using the modular principle as a dominant characteristic seems to have been minimal. I believe that the lack of a clear hierarchy of major features relegated this development to insignificance in spite of the monumentality, spacial richness, and plasticity of the solutions. To be sure, the central bay of those churches of the group which were built on a cruciform plan was automatically emphasized by its location, and the central bay of St. John's in Ephesus is somewhat larger than the other bays[45]. In the church of the Holy Apostles the central bay was also accented by constructing it with windows, a feature not provided

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[44] IDEM, 206ff. for the proposed chronology, which may need to be revised; in BUCHWALD, The Church of the Archangels in Sige near Mudania. Vienna 1969, 56, I suggested the same chronology for all major features based primarily upon an examination of the masonry which was visible before the restoration of the church; GEORGE, *ibid.* 69ff. came to similar conclusions.

[45] Ephesos IV–3, Fig. 44 and Pl. LXIX for a reconstruction with equal domes except for the differences which result from the somewhat different sizes and shapes of the domed bays; H. PLOMMER, St. John's Church, Ephesus. *Anatolian Studies* 12 (1962) 121 and Fig. 1 for a reconstruction with the central dome on a drum; see also BUCHWALD, The Church of the Archangels, 55ff. for a brief summary of extant domes on drums during this period.

for the other domes[46]. In basilica B in Philippi, which seems to have been constructed as a direct echo of St. Eirene using Constantinopolitan workmen, the western nave bay is de-emphasized by covering it with a groined vault and changing its dimensions with respect to the eastern bay, which was domed, thus creating a discontinuity between the two major nave bays which clearly places the church outside development B of the 2nd Byzantine architectural style[47].

Indeed, there may be still another, though related reason for the lack of continuing interest in the modular principle in Byzantine church architecture. In the churches of development B a basic question is raised concerning the meaning of the dome in Byzantine architecture. The symbolic content of the dome in Byzantine architecture has frequently been noted and documented. However, in the churches of our group the dome occurs two or more times over major parts of the building in locations which are not all likely to have required symbolic emphasis. While the symbolic content of the dome need not have been lost by its multiplication, the symbolic significance of the dome in these churches may have lacked the forceful statement of solutions with only a single, dominant dome. On the other hand, the dome may also have been used in these churches simply as a structural device which was convenient, if not very simple to erect, for the covering of relatively large spaces with a minimum of intermediate supports, utilizing building material which had the advantage of being almost fire proof, and which was readily available in areas where wood adequate in size was difficult to obtain[48]. The considerable spans achieved in many of the Churches of development B are equalled only in the very largest basilicas with wooden roof trusses[49]. Indeed, it seems possible that the lofty and adventurous solutions found in Asia Minor reflect a competitive spirit, a kind of one-upmanship, among architects, cities, or bishopries like Ephesus, Sardis, and Philadelphia, which eventually bore its greatest fruit in the major churches of Justinianic Constantinople.

The imitation and revival of churches with modular domed bays constructed on a cruciform plan in the 11th century in buildings such as San Marco in Venice is well known[50]. The reverberations of this revival can

[46] Procopius, *ibid.* I 4, 9ff., with a description which may also be interpreted to mean that the central dome was constructed on a drum (κυκλοτερής), as in the translation by H. B. Dewing and G. Downey, Cambridge, Mass. 1971.

[47] P. Lemerle, Philippes et la Macédoine orientale. Paris 1945.

[48] S. Guyer, Die Bedeutung der christlichen Baukunst des Inneren Kleinasiens für die allgemeine Kunstgeschichte. *BZ* 33 (1933) 101 for a discussion of utilitarian reasons for the use of vaulting in Asia Minor with further references.

[49] Buchwald, The Church of St. John, 315 for the spans of development B churches.

[50] O. Demus, The Church of San Marco in Venice. Washington D. C. 1960, 88ff.

be traced in Sant' Antonio in Padua and in the Cathedrals of Perigoux and Angoulême in southern France in the 12th century, and continued to be felt in the Veneto into the 16th century.

Much less well known is the group of late 11th and 12th century churches in Apulia[51], as well as a small group of undated churches on Cyprus[52] which may also probably best be explained in terms of a revival of the forms which we have designated development B of the 2nd Byzantine architectural style. The models for the Apulian churches, which were built with two or three roughly equal domes over the nave, should probably be sought in western Asia Minor, or perhaps on Cyprus, where remnants of churches with rather similar forms are still extant. The buildings, perhaps some still in use, could have been seen by Italian crusaders, merchants, or even master builders. In another investigation I have suggested that the imitation of the church of the Holy Apostles in San Marco in Venice may, perhaps at least in part have been caused by local rivalries within the patriarchate of Aquileia[53]. A further reason for the revival of unmistakably earlier Byzantine forms, both in Venice and in Apullia, may also be the desire to document a glorious Early Christian heritage, a heritage which, if it ever had existed in these cities, certainly had left no comparable monumental architectural examples.

Development C

The 3rd development within the 2nd Byzantine architectural style is by far the most important, not only for Asia Minor but for the future of Byzantine architecture. It may be briefly described as the combination of the traditional aisled basilican church plan and a single dominant domed bay in the nave. The buildings of development C were constructed over the very long period of time spanning at least from the 5th to the 9th centuries. The most important and best known example is Justinian's Saint Sophia in Constantinople. However, at least at present Constantinople provides no

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[51] Several little known examples are discussed in C. Laganara, Evidenze strutturali nella copertura a cupola di alcuni esempi altomedioevali del territorio di Brindisi. *Bollettino d'Arte* s. V, 60 (1975) 82ff., with extensive further references. 12th century churches in Sicily like S. Giovanni degli Eremiti and S. Cataldo in Palermo may also be distantly related to development B, although scale, detailing, as well as spacial and structural solutions differ significantly.

[52] See fn. 37 above and A. and J. Stylianou, Peristerona (Morphou). Κυπριακαὶ Σπουδαί 27 (1963) 243ff.

[53] H. Buchwald, Eleventh Century Corinthian-Palmette Capitals in the Region of Aquileia. *Art Bulletin* 48 (1966) 155ff.; the same rivalries between Aquileia and Venice may already have caused similar revivals there in the Carolingian period.

example of a domed basilica[54] built before the 2nd quarter of the 6th century. The only other secure example in the city is the initially planned form of the church of St. Eirene[55]. The church of St. Polyeuctus may have belonged to the same group of buildings, but not enough remains to be certain concerning its original floor plan or vaulting solution[56].

Buildings belonging to this development are even less frequent in other parts of the Byzantine empire, with the exception of Asia Minor. In mainland Greece, for instance, we may list the basilica on the Ilissos, which has been attributed to the early 5th century without firm evidence[57], and the church of St. Sophia in Salonica, for which I have suggested a date between 780 and 787 based upon the inscription in the apse[58]. It seems significant to me that there is a gap of perhaps more than three centuries in this development in Greece, centuries during which the most experimental, the most magnificent, and the most pregnant examples for the future of Byzantine architecture were constructed in Constantinople and in Asia Minor. This gap cannot be filled by occasional examples on the edges of present day Greece or on the islands, such as Basilica B at Philippi, the Hekatonpyliani on Paros, or St. Titus in Gortyna[59]. The church in Philippi seems to be a direct reflection of the development in Constantinople[60], and the Greek islands, today politically united with Greece, may well, during the period under consideration, have been more closely tied to the centers on the western coast of Asia Minor. Nor can the dramatic lacuna of evidence on the Greek mainland be fully explained by the Slav invasions. To the contrary, the numerous basilicas without domes over the naves constructed in the 5th and 6th centuries, reported to surpass 300 in number, suggest that architects and patrons in mainland Greece and, for the most part also on

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[54] KRAUTHEIMER, Early Christian and Byzantine Architecture, 534, defines *domed basilica* narrowly with a dome over the *center* of the nave, a limitation for which I can find no good reason; STANZL, Längsbau u. Zentralbau, 79ff. reviews some of the evidence and provides references to the extensive earlier investigations.

[55] See fn. 43 above.

[56] C. MANGO and I. ŠEVČENKO, *DOP* 19 (1961) 243ff.; M. HARRISON and N. FIRATLI, *DOP* 22 (1968) 195ff.; IDEM, *Türk Arkeoloji Dergisi* 16 (1968) 83ff., 101ff.; *ibid.* 19 (1970) 191ff.

[57] G. SOTIRIOU, Παλαιὰ χριστιανικὴ βασιλικὴ τοῦ Ἰλισσοῦ. *Ἐφημερὶς ἀρχαιολογική* (1919) 1ff.; ORLANDOS, Βασιλική I, 185f.; M. CHATZIDAKIS, Remarques sur la basilique de l'Ilissos. *Cahiers Archéologiques* 5 (1951) 61ff. for a review of the date and reconstruction; the massive piers seem to indicate that the bay before the altar was, indeed, vaulted.

[58] BUCHWALD, The Church of the Archangels, 43.

[59] H. H. JEWELL and F. W. HASLUCK, The Church of Our Lady of the Hundred Gates in Paros (Panagia hekatonpyliani). London 1920. T. FYFE, *Architectural Review* 22 (1907); A. K. ORLANDOS, *EEBS* 3 (1926) 301ff.

[60] See fn. 47 above.

the islands held tenaciously onto the forms of the 1st Byzantine architectural style until building activity was stopped by the invasions.

The situation is similar in Italy, where buildings of development A within the 2nd Byzantine architectural style, like San Lorenzo in Milan and San Vitale in Ravenna, stand out as exceptions among the great number of simple basilican churches which were constructed there on into the 7th century. To my knowledge the basilica with a domed unit over the nave is not known in a single example in Italy except in medieval revivals of forms some of which may, perhaps, have been observed in Asia Minor.

Development C is almost as rare in the Balkans, where it is represented by occasional examples like the domed church at Caricin Grad, St. Elias at Pirdop, and St. Sophia in Sophia[61]. On the eastern Mediterranean littoral a domed basilican church like that of Kasr ibn Wardan, built between 561 and 564, stands out like a foreign intruder among most other Syrian church buildings of the period[62].

In stark contrast to other provinces of the empire, the basilica with a domed unit over the nave is represented by numerous and varied examples in Asia Minor[63]. The earliest examples are probably those in which a unit with heavy masonry piers on a square plan is still not effectively integrated with the basilican fabric of the building. While none of these buildings is preserved well enough to be certain that this unit was indeed covered by a dome or that it was even vaulted, it seems reasonable to assume that such massive piers would have been required to carry a vault rather than a wooden roof. Towers of considerable height with wooden rooves were carried by relatively slender walls rather than by heavy, squarish piers in such buildings as San Lorenzo in Milan, in which the central space is larger than that of the churches under consideration[64].

Although the predecessor to Justinian's church of St. John at Ephesus is built on a cruciform plan, each arm is basilical in its organization and each is connected to a central unit with massive piers, which is square in plan, and which may well have supported a dome or a domical vault[65]. The

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[61] R. F. Hoddinott, Early Byzantine Churches, *passim*; Sas-Zaloziecky, Die byzantinische Baukunst, *passim*; Condić and Popović, Caricin Grad, *passim*; P. Mutavchiev, L'église du Cerf près de Pirdope. *Bulletin de la Société Archéologique Bulgare* 5 (1915) 20ff.

[62] H. C. Butler, Ancient Architecture in Syria, Div. II Sect. B-1, Leyden 1907, 26ff. and *passim*. The Syrian temples and audience halls with 4 supports are not relevant to a discussion of the dome over the nave of a basilica, although a relationship of some sort may exist. I have also omitted a discussion of comparable Armenian and Georgian examples.

[63] See also the material and arguments presented in Guyer, Die Bedeutung, *passim*.

[64] See fn. 23 above.

[65] Ephesos IV–3, particularly Pls. 71, 72.

basilican arms of the church are related to the central unit in an additive manner still strongly reminiscent of the 1st Byzantine architectural style. In this respect the church seems to have been similar to the basilica on the Ilissos in Athens. In the so-called domed church in Meriamlik, which I propose to call Ayatekla church 2 (Fig. 3), the square unit with massive piers at each corner is somewhat more strongly integrated with the nave arcades[66].

The most intriguing problem posed by combining a dome and the nave of a basilica, and the problem which was most difficult to resolve was the integration of the major lateral arches and the piers which supported the dome with the traditional features of the nave, such as the colonnades and clerestory. A satisfactory solution is found neither in Ayatekla church 2, where the piers are not coordinated with the rhythm of the nave supports, nor in Justinian's St. Sophia, where on the interior the major piers and lateral arches are fused with the clerestory walls using an unsatisfactory and easily discerned optical and structural manipulation, and where on the exterior the major lateral arches lack integration with all other architectural features[67].

A partial solution to the problem, which had the disadvantages of the S. Sophia interior, was to dimension the width of the lateral arches supporting the dome equal with the width of the clerestory walls, so that the arches would project neither on the interior nor on the exterior. Examples include the church at Kasr Ibn Wardan in Syria[68], the baptistery of the Hecatonpyliani on Paros[69], and probably the second phase of St. Nicolas at Demre (Myra), which originally seems to have been vaulted in a manner resembling the solution at Kasr Ibn Wardan[70]. Although the so-called domed church

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[66] HERZFELD and GUYER, Meriamlik, 46ff., for a reconstruction with a fully vaulted solution and an attribution to the latter part of the 5th century; G. H. FORSYTH, Architectural Notes on a Trip through Cilicia. *DOP* 11 (1957) 223ff. for a reconstruction of the square unit with a wooden roof and an attribution to the second half of the 5th century; M. GOUGH, The Emperor Zeno and some Cilician Churches. *Anatolian Studies* 22 (1972) 202ff., supports the view held by FORSYTH concerning the lack of vaulting and implies a date in the reign of emperor Zeno before 491. My designation for the church avoids these problems; Ayatekla church 1 would then be the major basilica which was probably the church of St. Thecla. The ruins are known as *Ayatekla* on current maps and road signs, and the local population apparently no longer knows the ruins by another name.

[67] BUCHWALD, The Church of the Archangels, 45f., for a more extensive discussion of these shortcomings.

[68] See fn. 62 above.

[69] See fn. 59 above.

[70] Y. DEMIREL, Die Nikolaus-Kirche zu Demre. *Türk Arkeoloji Dergisi* 15 (1966); U. PESCHLOW, Die Architektur der Nikolauskirche in Myra. *Myra*. J. BORCHARDT, ed. (Berlin 1975), with extensive further references. Not a trace of the original vaulting solution is extant

at Dag Pazari may have had, and the east church of Alahan Monastery (Fig. 9) did have a wooden roof over the central unit, both of these churches seem to reflect the same desire to integrate the central unit with a basilical solution; while fully vaulted examples were certainly more monumental in appearance and more difficult to construct, the difference between wooden and vaulted constructions over the central units seems to me to be of secondary importance[71].

Another solution to the same problem is found in churches I have designated *cross-domed basilicas* in another investigation, because the lateral arches which support the domes project sidewards to develop a cross-like space inside the building, underneath the major dome[72]. The cross is not, however, emphasized sufficiently, either on the interior or on the exterior to be recognized as a fully expressed cruciform and seems therefore to have had no symbolic significance. To my knowledge the church of the Archangels in Sige, perhaps built about 780, is the only example which has survived sufficiently, in Asia Minor, to obtain a three-dimensional impression of how the nucleus of such a building may have looked. Even though its cupola was rebuilt in 1818 and changes in its plan were apparently required by the topography, and even though the original construction was probably never completed, its central core clearly shows many of the most important characteristics of cross-domed basilicas[73].

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in the nave. P. attributes this phase to the 8th century and frequently refers to it as belonging to the iconoclastic period. However, none of the other buildings with similar solutions can be dated later than the 6th century. The similarities of some features with those of cross-domed basilicas noted by P. may indicate that St. Nicolas was transitional between domed basilicas and cross-domed basilicas, suggesting a date in the 7th century. This date, in turn, agrees well with P's comparison of the church to St. Clement in Ankara, which I have also attributed to the 7th century (see fn 75 below).

[71] P. VERZONE, Alahan Monastir. Turin 1956; which is now partially superseded; FORSYTH, Architectural Notes, 228ff., 233ff.; M. GOUGH, The Emperor Zeno; IDEM, *Anatolian Studies* 5 (1955) 115ff.; *ibid.* 13 (1963) 105ff.; *ibid.* 14 (1964) 185ff.; *ibid.* 17 (1967) 37ff.; *ibid.* 18 (1968) 159ff.; IDEM, Karlik and Dag Pazari. *Türk Arkeoloji Dergisi* (1959); *ibid.* 1968; *ibid.* 1970; A. C. HEADLAM, Ecclesiastical Sites in Isauria. *Supplementary Papers of the Society for the Promotion of Hellenic Studies* I, No. 2 (London 1892) is still valuable for illustrations.

[72] BUCHWALD, The Church of the Archangels, 47ff., for a more detailed account.

[73] *Ibid., passim.* The date depends upon the concurrence of a late inscription which is not extant but was recorded before it was lost, upon the forms of monograms carved on capitals now in the church, and upon stylistic evidence. On p. 42 and in my conclusion on p. 63 I pointed out that numerous criteria can be interpreted as contradicting the attribution, but that at present the suggested date appears to be reasonable. The rejection of the criticism proposed by O. FELD, *BZ* 64 (1971) 387f., who makes no alternative suggestion concerning the date, may be summarized briefly as follows: 1) The vertical joint in the northern nave wall is mentioned in the analysis of the masonry, p. 24–25, rather than in the general description of the building which begins on p. 10. 2) The proportion of the columns of the

Other, more important and more fully articulated examples, for instance the church of the Koimesis in Iznik (Nicaea), built in the period

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trifora is irrelevant because they were obviously re-used and could have been shortened at any time after their production. 3) In contradiction to F's observation on p. 387, the trifora columns do not continue in the masonry on which they stand, for they rest on low squarish pedestals clearly visible in my Fig. 29. 4) The comparison of the trifora in the northern wall with that in the same position in the Fenari Isa Camii is poorly chosen because of the very different proportions and the entirely different relationship to the surrounding wall surfaces; moreover, the ground level north of the trifora in Sige could not have been level with the nave floor because of the solid rock outcropping underneath the north chapel, clearly shown in Fig. 32 and described on p. 25. 5) For the same reason and in direct contradiction to F's observations, if a gallery north of the church was planned during phase A, then it could only have been a gallery without an aisle underneath unless the solid rock was to be removed, in which case the gallery would become an aisle. 6) "die Baugeschichte lehrt..." is irrelevant because we know next to nothing concerning the motivations behind architectural choices, particularly in the obscure period under consideration, and we know even less concerning why buildings were constructed in a particular size. 7) F's example of the church at Kurşunlu as a smaller building type which could have been utilized in Sige is misconceived because, together with its chapels, which are contemporary with the church, Kurşunlu is about 1.80 m wider than the church of the Archangels; Kurşunlu was, at any rate, built with recessed brickwork probably in the Comnenian period (C. MANGO, The Monastery of St. Abercius at Kurşunlu [Elegmi] in Bithynia. *DOP* 22 [1968] 169ff.), and nothing in the construction of the church of the Archangels suggests a similar chronological attribution. 8) The lack of pastophories in Sige is explained on pp. 42 and 63, rather than on p. 51f. because the latter discussion deals with the location of pastophories with respect to other features, a discussion in which a church without pastophories has no place. 9) As stated above, the date I suggest for the church is not based upon a comparison of stylistic details, but rather, upon a late inscription recorded by a reputable scholar, F. W. HASLUCK; the comparisons demonstrate that the architectural forms do not, in general, contradict the statement made in the inscription. 10) The niches on the exterior of the Sige apse are not compared with other niches in similar locations in detail; rather, on pp. 61 and 63 I observe that such niches are frequent in churches built in the 8th century and later, but were apparently not used in the Koimesis or earlier. 11) As stated clearly on p. 28f. the monogrammed capitals of the trifora are re-used in those positions; nevertheless, they may be dated independently to the same period as the style of many architectural forms of the church, which is, in turn, the same period during which the transcribed inscription states that the church was built; while these concurrences may be entirely coincidental, they may also indicate that the capitals were carved for the initial construction of the church, an interpretation I find more reasonable. 12) With respect to pastophories F. cites LASSUS, who reproduces BUTLER's plan of Kasr Ibn Wardan which is referenced in my fn. 203, and who states that it is a church with a tri-partite solution without proposing new evidence; whatever the use of the flanking spaces at Kasr Ibn Wardan was, they are not discreetly separated rooms like those of the cross-domed basilicas. 13) The information concerning the rooms flanking the apse of St. Nicolas in Demre presented by F. would not have been available to me until the publication by U. PESCHLOW, Die Architektur der Nikolauskirche, six years after the publication of my investigation. Many of the issues raised by D. I. PALLAS, *Hell* 24 (1971) 423ff. can be resolved only by excavation and a careful investigation of the masonry fabric of the church.

before iconoclasm probably in the late 7th or early 8th centuries[74], and the church of St. Clement in Ankara, which I have attributed to the 7th century on stylistic grounds[75], have all but disappeared in the last 60 years. On the other hand, in 1932 a cross-domed basilica of monumental dimensions within the Church of the Virgin in Ephesus was published by its Austrian excavators[76]. While it has been attributed to the early 6th century, without firm evidence, I would ascribe the building to a somewhat later period because of similarities with other cross-domed basilicas, and because of important differences to 6th century buildings like St. John's in the same city. The enormous importance of the church of the Virgin, as well as the importance of Ephesus as a political, economic, and religious center may, perhaps, explain an early appearance of this building type in the city[77]. Indeed, it seems possible that the cross-domed basilica in Ephesus is the first building to be erected anywhere using this solution, and that it constitutes the point of departure for other churches with similar architectural features. In this context it is important to point out that most domed basilicas can be reasonably attributed to the period before the Persian invasion of Asia Minor in the early 7th century, while most cross-domed basilicas were probably built after that invasion[78]. Whether or not the cross-domed basilica in Ephesus constitutes the source for other churches with similar plans, these buildings, often located in important and strategic centers in Asia Minor appear to represent a church type favored for a general reconstruction program following the Persian and other invasions of the 7th and 8th centuries. With the re-dating of the Kariye Camii, the Kalenderhane Camii, and the Gül Camii in Constantinople to the 11th and 12th centuries not a single example of this church type which may be dated

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[74] The most important arguments concerning the date of the building are summarized in BUCHWALD, Church of the Archangels, 44 with relevant references; also U. PESCHLOW, Neue Beobachtungen zur Architektur und Ausstattung der Koimesiskirche in Iznik. *Istanbuler Mitteilungen* 22 (1972) 145ff.

[75] BUCHWALD, *ibid.* 37ff. with further references; particularly also P. G. DE JERPHANION, L'église de Saint-Clément à Angora. *Mélanges de l'Université Saint-Joseph* 13 (1928) 113–143.

[76] FOSS, Ephesus, 52, with extensive further references; particularly also *Ephesos* 4–1 (1932) 51ff.; E. WEIGAND, *Gnomon* 2 (1935) 203ff.; F. FASOLO, La basilica, *passim.*

[77] FOSS, *ibid. passim.* for an evaluation of the importance of Ephesus during the period under consideration.

[78] IDEM, Archaeology and the "Twenty Cities" of Byzantine Asia. *American Journal of Archaeology* 81 (1977) 469ff., with extensive further references; IDEM, Ephesus, 103ff.; IDEM, Byzantine and Turkish Sardis, 53ff., for the decline of major cities in western Asia Minor after the Persian invasions.

before the 11th century is now known in the capital[79]. On the other hand, in these and other Constantinopolitan churches of the 11th and 12th centuries forms typical of churches built in the 7th and 8th centuries seem to have been imitated; at present it remains an open question whether the imitated originals were buildings in the capital which have been lost or whether they were the cross-domed basilicas now known in Asia Minor.

The church of St. Sophia in Salonica seems to be an isolated example of the cross-domed basilica outside Asia Minor. Because of its late construction date, in the last quarter of the 8th century[80], it seems possible that its forms were designed under the inspiration of the earlier buildings using a similar plan in Asia Minor. Indeed, St. Sophia could have been built by a master mason, or even with the aid of work crews from Asia Minor, for little building activity on a monumental scale seems to have occured in northern Greece in the generations preceding its construction and expertise may well have been imported. While the construction of the church may be related to the imperial family, the evidence now available indicates that precedents for its design are to be found in Asia Minor rather than in the capital[81]. The suggestion that St. Sophia was constructed following a major Byzantine victory over the Slavs in 783[82] fits well into the pattern proposed above for cross-domed basilicas in Asia Minor.

Cross-domed basilicas still invariably contained incongruities of design because of the difficulties involved in relating the supports under the dome to the traditional features of the basilica. Even in the best examples, such as the Koimesis in Iznik and St. Sophia in Salonica the aisles were pushed sidewards by the bulk of the piers, the rooms flanking the apse were not properly related to the aisles, and the major piers presented large inert

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[79] D. Oates, A Summary Report on the Excavations of the Byzantine Institute in the Kariye Camii: 1957 and 1958. *DOP* 14 (1960) 223ff.; C. L. Striker and Y. D. Kuban, Work at Kalenderhane Camii in Istanbul. *DOP* 22 (1968) 185ff.; H. Schäfer, Die Gül Camii in Istanbul (*Istanbuler Mitteilungen*, Beiheft 7). Tübingen 1973; also W. Müller-Wiener, Bildlexikon zur Topographie Istanbuls. Tübingen 1977, 159ff., 153ff., 140ff., and T. F. Mathews, The Byzantine Churches in Istanbul. University Park and London, 1976, 40ff., 171ff., 128ff., both with extensive references.

[80] Buchwald, The Church of the Archangels, 43, for a summary of the evidence, which is based upon an inscription and monograms of Irene, Constantine VI, and Bishop Theophilus.

[81] P. L. Vocotopoulos, The Role of Constantinopolitan Architecture, in: XVI. Internationaler Byzantinistenkongress, Akten I/2 (*JÖB* 31/2) (1981) 567 believes that the design and the masonry of the church are to be linked to Constantinople without, however, refering to specific evidence, and points out that several buildings in the southern Balkans may have been influenced by the design of St. Sophia.

[82] C. Mango, Architettura Bizantina. Milan 1974, 161f. points out that the construction of the church may, perhaps, be related to the victory of 783.

surfaces which were difficult to articulate and impossible to integrate with the lateral arcades. Only some of these problems were resolved by expanding the lateral arches underneath the major dome until they reached the exterior walls of the church, and by placing the aisles underneath the arches in a solution I have designated the *cross-domed basilica with inscribed aisles*[83]. The important church at Dereağzi in Lycia is one of the few extant examples, and the only example now known in Asia Minor[84]. This solution is also found in the undated church of St. Sophia in Vize in Turkish Thrace[85], and may, perhaps, have been developed from the forms of St. Eirene in Constantinople, which was rebuilt in 740[86].

3. The Third Byzantine Architectural Style

In contrast to the 2nd Byzantine architectural style, the 3rd style is characterized by the use of relatively few, highly standardized building types. In the 3rd style churches present not so much an individual, boldly experimental approach to the resolution of architectural problems, as was frequently the case in buildings of the 2nd style, but rather, relatively slight variations on basic themes. Although variations on basic themes were always important in Byzantine architecture, during the 2nd Byzantine architectural style they seem to have played a subordinate role, while in the 3rd style they played a dominant one.

The difficulties involved with relating a domed bay directly to the nave of a basilica were not entirely resolved until the 3rd Byzantine architectural style. Now, in the inscribed cross church type which is characteristic of the earlier years of the style[87], the individual features of the basilica, such as

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[83] Buchwald, The Church of the Archangels, 52f.

[84] In *ibid.*, 48ff. I proposed a 9th century date; J. Morganstern, The Church at Dereagzi: its date and its place in the history of Byzantine Architecture, in: Actes du XIV^{e} Congrès intern. des études byzantines 1971, III, Bucarest 1974–1975 suggests a date in the early 10th century; idem, The Church at Dereagzi: a Preliminary Report. *DOP* 22 (1968) 217ff.; idem, The Church at Dereagzi: 2nd Preliminary Report. *Türk Arkeoloji Dergisi* 18 (1969) 85–97; Prof. Morganstern has kindly related to me that in his forthcoming publication of the building a 9th century date will be proposed.

[85] C. Mango, The Byzantine Church at Vize (Bizye). *ZRVI* 11 (1968) 9ff., suggests a *terminus ante quem* in the early 10. C.; S. Eyice, Les monuments byzantins de la Thrace turque. *Corsi di Cultura sull' Arte Ravennate e Bizantina* 18 (1971); F. Dirimtekin, The Church of St. Sophia (Suleiman Paşa) at Vize. *Ayasofya Müzesi Yilligi* 3 (1961).

[86] See fns. 43 and 44 above.

[87] I prefer to use the rather old fashioned term *inscribed cross* church type because none of the terms which have been used more recently seem to me to be as brief and at the same time as descriptive. The term *quincunx* describes a two-dimensional geometric figure which

side aisles, arcades, and clerestory windows, are eliminated or reduced until the original form cannot any longer be recognized. In an entirely new conception the major barrel vaults which support the more or less centrally located dome are extended and designed to clearly and visually express a symbolically and structurally coherent cruciform both on the interior and the exterior. The cruciform is no longer blocked from view or limited in dimensions by the side aisles. The dome, now raised on a high drum clearly dominates not only the church itself, but usually also the surrounding monastery, town, or countryside. The lower vaults and the major barrel vaults act as a visual and spacial transition between the surrounding buildings or landscape and the predominant cupola. The massive corner piers underneath the dome are dissolved into a logical system composed of thin columns, structural archways, and exterior walls which carry the loads and thrusts with apparent ease. Although the ancient tradition of the basilica is still echoed in the columns under the dome and in the aisle-like passageways which flank the nave, the inscribed cross church is no longer a combination of the domed unit with the basilica, but rather, an amalgamation which all but belies that the individual forms which constitute the body of the church were ever distinctive, isolated parts.

The many excellent examples of the inscribed cross church type in Constantinople are well known and need be presented here only briefly. The Church of the Virgin of Constantine Lips, built early in the 10th century, is the earliest securely dated example not only in the city, but also in the entire realm of Byzantine architecture[88]. However, in another investigation I suggested that the forms of the church of St. John in Trullo, usually assigned to the 11th–12th century period, permit an attribution before the church of Constantine Lips, and that the building was therefore probably constructed in the 9th century[89]. It may therefore well be the earliest example of the inscribed cross church type in Constantinople.

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is difficult to relate to the three-dimensional features of a church; the term *four-column-type* refers to relatively inconsequential features and may be misleading because examples with two or six columns, as well as other support forms also exist; the term *cross-in-square* may also be misleading because many of the churches do not have square plans. The term *domed inscribed cross* would be even more accurate, but is unnecessary because examples without domes are rare.

[88] A. H. S. Megaw, The Original Form of the Theotokos Church of Constantine Lips. *DOP* 18 (1964) 279; Mathews, The Byzantine Churches 322ff.; Müller-Wiener, Bildlexikon 126ff., each with extensive further references.

[89] Buchwald, Sardis Church E – a Preliminary Report. *JÖB* 26 (1977) 290, fn 96; Mathews, *ibid.* 158ff. and Müller-Wiener, 144ff., both with extensive references, descriptions, illustrations, and the previous attributions.

The *Nea Ecclesia* of Basil I, consecrated in 880 and known only from brief descriptions is frequently cited as the first inscribed cross church. However, the description in Photius' 10th Homily refers to another church, and the description by Constantine Porphyrogenitus would apply better to a church with five domes on a cruciform plan, like the Holy Apostles, than to an inscribed cross church with corner domes. Even if the *Nea* had been built as an inscribed cross church it need not have been the first church of that type[90].

In Asia Minor there are a number of churches with the basic features of inscribed cross churches which may, perhaps, be attributed to the period before the late 9th century either for historical reasons, or because they appear to be transitional, combining earlier characteristics with those of the new church type.

The best preserved and perhaps the most important is the church now known as the Fatih Camii in Tirilye (Fig. 12, 13, 28), on the south shore of the Marmara, which I have tentatively attributed to the 2nd third of the 9th century on stylistic grounds in my work on the church of the Archangels in Sige, located only a few kilometers away. While its plan and vaulting solution show all of the major attributes of the inscribed cross church type, the rather awkward relationship of the chamber flanking the bema on the north to other features of the church, and the probable existence, originally, of side aisles hark back to the cross-domed basilican solutions which were constructed in Asia Minor in previous centuries[91]. The cleanly geometric cylindrical form of the drum of the major dome at Tirilye is similar to the drum of St. John in Trullo, and both drums are fenestrated by eight large windows with similar details; however, the drum of St. John's is somewhat lower and is decorated by a trim course over the extrados of the window arches, relating it to the still somewhat more complex forms found in the drum of the major dome of the Myrelaion in Constantinople, which was built

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[90] R. J. H. JENKINS, and C. A. MANGO, The Date and Significance of the 10th Homily of Photius. *DOP* 9–10 (1955–1956) 125ff.; J. P. RICHTER, Quellen der byzantinischen Kunstgeschichte. Vienna 1897, 352ff. for the text by Constantine Porphyrogenitus; BUCHWALD, *ibid.* 277f. for additional reasons to doubt that the text by Porphyrogenitus refers to an inscribed cross church with five domes.

[91] BUCHWALD, The Church of the Archangels, 51ff. and *passim*, with additional stylistic evidence for the suggested dates and earlier references; C. MANGO and I. ŠEVČENKO, Some Churches and Monasteries on the Southern Shore of the Sea of Marmara. *DOP* 27 (1973) 236ff., with further illustrations, description, and history, point out that the monogram capitals tentatively used by HASLUCK to date the church cannot be used to date the church with precision.

in the 10th century[92]. The details of the drums of the major domes therefore also suggest that the church in Tirilye was built before the church of St. John in Trullo.

Not enough remains of the near-by church of St. John in the former Pelekete Monastery to recognize more than the basic features of the eastern part of an inscribed cross church (Fig. 14–16). The building is reported to have been re-built before the end of the 8th century, and the stratified masonry of its most prominent interior walls and piers, composed of bands of approximately four courses of ashlar which alternate with bands of approximately five courses of brick is similar to masonry in Constantinople and elsewhere which may be attributed to the 8th, 9th, and early 10th centuries[93]. Although the chambers flanking the bema are better integrated with other features of the church in Pelekete than in Tirilye, the axes of their exedrae still do not coincide with those of the naos corner bays as they do in most later inscribed cross churches.

Three churches excavated in Side, on the southern coast of Asia Minor were probably also designed using the principle of the inscribed cross, although there is not sufficient evidence to be certain concerning the vaulting solutions (Fig. 17–24, 29, 30). Church H has rooms flanking the bema without exedrae, a feature which would be unusual in fully developed inscribed cross churches. A relatively early date for the church has therefore been postulated, and it has been suggested that all of the churches in Side were constructed before the final destruction of the city, probably in the late 9th century[94].

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[92] C. L. STRIKER, The Myrelaion (Bodrum Camii) in Istanbul. Princeton 1981; MATHEWS, The Byzantine Churches, 209ff. and MÜLLER-WIENER, Bildlexikon 103ff., both with additional illustrations and references.

[93] C. MANGO, and I. ŠEVČENKO, *ibid.* 242ff., with further illustrations and references. My notes on the church were made in 1965. The bricks, which are re-used, often measure 0.33 or 0.40 × 0.15 × 0.05 m; the mortar joints are frequently about 0.06 m high, providing a ratio between brick and mortar joint of about 1 : 1.2. The N. E. column, which is not shown in the sketch plan published by MANGO and ŠEVČENKO, was *in situ* when I visited the church, and carried a well cut rather typical "Theodosian" capital carved with fine tooth acanthus similar to that of the S. E. column. BUCHWALD, The Church of the Archangels, 57ff. for the masonry forms.

[94] S. EYICE, L'église cruciforme byzantine de Side en Pamphylie. *Anatolia* 3 (1958) 35ff. for illustrations, a description, discussion, and evaluation of church H and reasons for believing that the city was abandoned by the late 9th century; IDEM, Un baptistère byzantin à Side en Pamphylie, in: Actes du V^e^ Congrès international d'archéologie chrétienne (*Studi di Antichità Cristiana* 22). Città del Vaticano – Paris 1957, 577ff.; IDEM, La ville byzantine de Side, in: Actes du X^e^ Congrès d'études byzantines. Istanbul 1957, 130ff.; A. M. MANSEL, Bericht über Ausgrabungen und Untersuchungen in Pamphylien in den Jahren 1957–1972. *Archäologischer Anzeiger* 1975, 52ff. for a chapel with four columns which has been recon-

While other similar buildings in Asia Minor could be cited, these examples suffice to demonstrate the existence of a group of buildings there which appears to bridge the gap between the fully developed inscribed cross churches of Constantinople and earlier developments. It is, of course, possible that these buildings were constructed not as predecessors to the fully developed inscribed cross churches, but rather, that they reflect church designs which combine the influence of the new type, perhaps developed in Constantinople, with older, "archaic" features more traditional to Asia Minor. However, even though new evidence may still be uncovered in Constantinople or elsewhere, it is important to emphasize that a group of similar transitional churches, which seems to pave the way for the classical solution of the inscribed cross church form is at least at present unknown not only in other Byzantine provinces, but also in the capital. It therefore seems reasonable to assume that Asia Minor at the very least played an important role in the development of the inscribed cross church type, and our present state of knowledge implies that the role it played may have been an instrumental one.

On the other hand, if we trace the further development of the 3rd Byzantine architectural style we face the enigma that after the initial apparent creative contribution, Asia Minor seems to have had only a minor, and possibly an insignificant place in the construction of major monuments. While a number of fully developed inscribed cross churches has been recorded in Asia Minor, and some of these may have been of excellent quality, we look in vain for the dozens of monastic and village churches built on the

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structed with a cupola over the nave. My own observations were made in 1975 and 1983. The fine facade articulation of the second phase of the small inscribed cross church which was built into the nave of the western (harbour) basilica is fully developed and must be attributed to a period later than the rather rudimentary articulation of church H. The identification of Chapel VI near the eastern basilica as an inscribed cross church is confirmed not only by the plan, but also by seven masonry fragments now in the ruins which were apparently found in the debris. They contain brick surfaces backed by mortared rubble. The surfaces of one fragment are cylindrical, and are bordered on two sides by vertical faces, apparently indicating that the piece was part of a cylindrical drum, probably with eight windows, like that of the Fatih Camii in Tirilye. Another surface is curved in two directions and must have been part of the conch of the major dome, the apse, or a pendentive. The church seems to have been built into a pre-existing room, and its lateral and western walls apparently belonged to the earlier building. The striking use of richly carved late antique spoils as piers in the northern, western, southern walls and on the western faces of the walls separating the bema from the flanking bays is unusual and may, perhaps, be explained by the interest in Antiquity in the 9th century which has been observed in other art forms. My designation is taken from MANSEL, but I hesitate to use his terminology, "bishop's palace", for the entire complex because there is apparently no clear indication of its use, and the area was, at any rate, probably outside the city walls when the inscribed cross church was built.

inscribed cross plan which we know from Greece, and good examples of monumental inscribed cross churches such as those of Constantinople are all but unknown there[95]. Moreover, the splendid later development within the 3rd Byzantine architectural style, which includes such truly amazing buildings as Hosios Lukas in Phocis and Nea Moni on Chios has apparently not left a single trace on the mainland of Asia Minor.

This lacuna cannot be attributed to the late 11th century depravations in Asia Minor, because many of the best examples of the 3rd Byzantine architectural style in Greece and in the capital were built before the battle of Manzikert opened the way for the Seljuk invasions. Nor do I believe that the lack of evidence is due entirely to the loss of significant monuments, although that may certainly be an important factor, because so many buildings constructed in other Byzantine styles *have* survived there, if only in a frustratingly fragmentary state of preservation. While other reasons, such as the reconstruction of early Byzantine buildings may also have played a role[96], I believe that the major reason for the lack of monuments in the 3rd Byzantine architectural style in Asia Minor may, perhaps, be that the effort of reconstruction required by the Persian and Arab invasions of the 7th and 8th centuries had, on the whole, been completed in the course of the 9th century. The creative drive and inventiveness which seem to be evident in many buildings constructed between the 7th and 9th centuries in Asia Minor should perhaps in part be explained as a by-product of the building activity generated by the spirit of reconstruction, which may have existed there during that period. At the same time as construction activity apparently began to diminish in Asia Minor, perhaps because fewer new build-

[95] G. Demetrokalles, Οἱ σταυροειδεῖς ἐγγεγραμμένοι ναοὶ τῆς Μικρᾶς Ἀσίας. *Μικρασιατικὰ Χρονικά* 13 (1967) 81–183; *idem*, Οἱ σταυροειδεῖς ἐγγεγραμμένοι ναοὶ τῆς Μικρᾶς Ἀσίας. Athens 1978, has collected most of the presently known examples in Asia Minor. Also S. Eyice, Tuzla'nin degirmenalti mevkinde bir bizans kalintisi. *Sanat tarihi yilligi* 5 (1973) 27ff. for a particularly large example not very far from Constantinople which has tentatively been attributed to the 2nd half of the 9th or early 10th centuries; N. Firatli, Découverte d'une église byzantine à Sébaste de Phrygie. *Cahiers Archéologiques* 19 (1969) 151ff.; Idem, Uşak-Selçikler kazisi ve çevre arastirmalari 1966–1970. *Türk arkeoloji dergisi* 19(1970) 111ff. for an inscribed cross church tentatively attributed to the 10th century; N. Thierry, L'art byzantin en Asie Mineure. *DOP* 29 (1975) 78ff.

[96] S. Vryonis, The Decline of Medieval Hellenism in Asia Minor and the Process of Islamization from the 11th through the 15th Century. Berkeley, Los Angeles, and London, 1971, *passim* for the historical background; F. W. Hasluck, Christianity and Islam under the Sultans of Konia. *ABSA* 19 (1912–1913) 191ff. for the possible construction of churches after the Seljuk invasions; Buchwald, The Early Christian Basilica EA, 201, for extensive reconstructions of church EA probably in the 9th or 10th centuries; P. Verzone, Le ultime fasi vitali di Hierapolis di Phrygia, in: Proceedings of the 10th International Congress of Classical Archaeology. 1973. Ankara 1978, 849ff., for similar reconstructions of early basilicas in Hierapolis.

ings were now required, reconstruction was slowly beginning in other Byzantine provinces such as Greece with buildings like the late 9th century church at Skripu[97]. The chronological coincidence of diminishing building activity in Asia Minor and increasing building activity in Greece could lead to the interpretation that at least some of the activity was directed or financed centrally from Constantinople. While such an interpretation certainly requires further investigation before it can be accepted, even if it is accepted, Constantinopolitan architects or work crews need not necessarily have been instrumental in determining the forms which were used. Regardless of such possibilities, which are only speculative at present, Greece overshadowed Asia Minor throughout most of the 3rd Byzantine architectural style. For the most part, after the 9th century Asia Minor seems, indeed, to be accurately characterized by the term "provincial back-wash". After the Seljuk invasions in the late 11th century many architecturally productive and creative parts of Asia Minor were, at any rate, permanently lost to the Byzantine empire.

4. The Fourth Byzantine Architectural Style

The 4th Byzantine architectural style is characterized, I believe, primarily by an *eclectic* attitude to the major forms of church architecture. I use the term *eclectic* without the pejorative connotations it has had in recent decades; the definition provided by the Oxford dictionary is "choosing from various sources, not following any one system." I find it impossible to identify either a clear line of development or a distinctive typical church type which dominated church production in the 4th Byzantine architectural style.

The earliest examples of the style may at present be found in the buildings I have attributed to the Lascarid dynasty[98], although antecedents may still be found, perhaps, in churches like the Kalenderhane Camii in Constantinople, which was built shortly before the Latin conquest of the city with forms rather typical of the 7th–8th century development in Asia Minor[99]. No two of the six churches I have attributed to the Lascarid

[97] P. L. Vocotopoulos, Ἡ ἐκκλησιαστικὴ ἀρχιτεκτονικὴ εἰς τὴν δυτικὴν Στερεὰν Ἑλλάδα καὶ τὴν Ἤπειρον ἀπὸ τοῦ τέλους τοῦ 7ου μέχρι τοῦ τέλους τοῦ 10ου αἰῶνος (*Βυζαντινὰ Μνημεῖα* 2). Thessaloniki 1975 for an excellent review of the material in N.W. Greece. See also the review by A. H. S. Megaw, *JHSt* 97 (1977) 237, who comments on the churches of N.W. Greece in terms of "a concerted missionary campaign in the second half of the 9th century".

[98] H. Buchwald, Lascarid Architecture. *JÖB* 28 (1979) 261ff.

[99] C. L. Striker and Y. Dogan Kuban, Work at Kalenderhane Camii in Istanbul. *DOP* 21 (1967) 267ff.; idem, *DOP* 22 (1968) 185ff.; idem, *DOP* 25 (1971) 251ff.; also Mathews, The Byzantine Churches, 171ff. and Müller-Wiener, Bildlexikon, 153ff., both with further illustrations and references.

period have the same floor plan. The smaller churches, on Chios off the coast of western Asia Minor, are vaulted basilicas without aisles, once with and once without a dome. Church 8 at Latmos is a normal inscribed cross church. The church of the Virgin at Krina, also on Chios, has a dome on an octagonal, niched base. In church E at Sardis elements of a Constantinopolitan inscribed cross church type are combined with basilican features, and with domes over the corner bays.

The choice of the solution which was to be used was apparently not made on the basis of an on-going tradition, but rather, primarily on the basis of historic interest or connotation, in some respects perhaps comparable with 19th century historicism. The church of the Virgin at Krina, for instance, was built as a somewhat smaller and somewhat simpler version of the very beautiful catholicon of the Nea Moni on the same island, which was constructed with imperial patronage before the middle of the 11th century[100]. It seems to me that the architectural forms, excellent execution, and rich ornamentation of the church at Krina may, perhaps, be explained by assuming that it was built under the patronage of John Vatatzes, the Lascarid ruler who re-conquered the island from the Latins in 1225, and that the Nea Moni was consciously chosen as a prototype to relate Vatatzes' own efforts as a patron of the arts and of religious institutions to the relics of a supposedly more perfect, certainly more secure, and perhaps also more legitimate, imperial past. The inscribed cross church plan of Latmos church 8 may also have been chosen for similar reasons, because there seems to be no precedent or immediate tradition for that church type either among the numerous earlier churches of the Latmos area which have been recorded, or among the other churches which may be attributed to the Lascarid dynasty[101]. It seems possible that in the minds of the 13th century builders

[100] C. BOURAS, Nea Moni on Chios. Athens 1982 *passim* for an extensive account and investigation of that church which supersedes all previous publications; BUCHWALD, Lascarid Architecture, 274ff. for the church at Krina, with further references; also A. C. ORLANDOS, Monuments byzantins de Chios. Athens 1930 for additional illustrations; C. BOURAS, Chios. Athens 1974, 30ff. suggests a date at the end of the 12th or early in the 13th century for the church at Krina; IDEM, The Marble Screen of Panaghia Krina in Chios and its Date. *DChAE* 1980–1981, 165ff. presents remains of a choir screen which appear to be dated to the period between 1056 and 1091 by an inscription, and dates the church to the same period. However, as a comparison between BUCHWALD, Lascarid Architecture, Fig. 28, and BOURAS' Pl. 33-a clearly demonstrates, remains of the same choir screen were re-worked and carefully re-used in the facade details of the church, and the 11th century screen should therefore be attributed either to an earlier construction of the same church or to another building.

[101] BUCHWALD, *ibid.* 268ff., and *passim*, with further references; particularly T. WIEGAND, Der Latmos (*Milet* 3/1). Berlin 1913, for the churches of the Latmos area.

or patrons the inscribed cross church type was related to the glorious period of expansion and political stability of the 10th, 11th, and 12th centuries.

A different type of eclecticism seems to have been responsible for the design of church E at Sardis. The basic features of the floor plan, much of the vaulting solution, the underlying principle of the *quadratura*, and even the dimensions of the building are almost the same as those of churches in Constantinople which were built during the zenith of Byzantine power. However, the standard solution was changed, at Sardis, by replacing the eastern piers flanking the bema with columns, thereby relating the plan to the basilicas of an even more prestigious, early Byzantine past. Small domes were grafted onto the corner bays of the naos, an idea borrowed from earlier examples, which added plasticity and, probably more important, richness and monumentality. The inventiveness displayed in this type of eclecticism, taking individual features from past styles and building types out of context to produce a new architectural entity stands in stark contrast to the design methods which seem to have been used in the 3rd Byzantine architectural style, and indeed in most buildings of Byzantine architecture, and appears to be a unique contribution of Lascarid architects to the late Byzantine architectural tradition[102].

The imitative, historicizing, eclectic character of Lascarid architecture may be traced in the architectural solutions of the Paleologue period which followed it. The most extensive, reasonably well preserved collection of churches built during the Paleologue period in a single city exists in Mistra, and the most striking characteristic of the architectural forms found there is the bewildering number of various church types. The church of St. Demetrius was built in the late 13th century on a basilican plan; the church of the Theodori was constructed on the scheme of Hosios Lukas and Daphni only a few years later; early in the 14th century the so-called church of the Afentico was apparently built in imitation of the Sardis church E type which seems to have been developed in Lascarid Asia Minor (the galleries of the Afentico may not have existed in Sardis, which had no court, but could have been used in more important Lascarid churches where court ceremonial was imperative); probably in the mid-14th century the church of St. Sophia was constructed on the traditional inscribed cross scheme. Not until the late 14th and 15th centuries were the earlier Mistra church types repeated in buildings like the church of the Virgin Evangelistria, in the Peribleptos, in the Pantanassa, and in the reconstruction of St. Demetrius[103].

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[102] BUCHWALD, *ibid.*, particularly p. 294ff., and IDEM, Sardis Church E, *passim*.

[103] M. CHATZIDAKIS, Mistras. Athens 1948; M. SOTIRIOU, Mistra. Athens 1956; N. V. GEORGIADES, Mistra. 2nd ed. Athens 1973; M. N. DRANDAKI, Mistra. Athens 1959, each with

While Paleologue churches are not as numerous in Constantinople, the same diversity is immediately evident in those examples which have been preserved there. In the late 13th century the south church of the Fenari Isa Camii was built on a plan reminiscent, in some respects, of earlier domed basilicas and of churches in Constantinople of the 11th–12th century period like the Fethiye Camii[104]. In the early 14th century the parecclesion of the Kariye Camii was built with a dome on a nave without side aisles, a conception reminiscent of the Lascarid church of the Virgin at Sikelia on Chios[105]. Only a few years later the parecclesion of the Fethiye Camii was constructed on the inscribed cross church plan[106].

In spite of the many variations in their floor plans and superstructures, most buildings of the 4th Byzantine architectural style in Constantinople are easily recognized because of their distinctive, extremely rich brick facade ornamentation. The buildings of Lascarid Asia Minor are, for the most part, just as richly ornamented, and I believe that it is rather safe to assume that Lascarid building practices directly influenced those of the capital. After all, there was little or no construction during the 57 years of Latin occupation, a span of time which is too long to expect building crews or building expertise to have survived in Constantinople. Of course builders could have been drawn to the capital by new Paleologue construction programs in the late 13th century from any of several provinces which had not suffered as much under Latin occupation. However, in most of these provinces, for instance in Epirus, Macedonia, Thrace, the Peloponnesus, Bulgaria, and southern Serbia fairly extensive building programs were

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further references; G. MILLET, Monuments byzantins de Mistra. Paris 1910 is still invaluable for determining how much of the buildings standing today are actually recent reconstructions, at times made with relatively little firm evidence concerning many architectural details.

[104] MATHEWS, The Byzantine Churches, 322ff., 346ff., and MÜLLER-WIENER, Bildlexikon, 126ff., 132ff., both with extensive illustrations and further references. The primary difference to domed basilicas is that in the Fenari Isa Camii the northern, western, and southern major barrel vaults which support the dome are almost equal, and hardly project outward beyond the dome and the pendentives. A similarity to the catholicon of the Mangana Monastery may also be constituted, but its remains are too fragmentary to be certain of its original forms. Cf. C. BOURAS, Problems of type Classification in the Katholicon of the Monastery of the Mangana in Constantinople? *Αρχαιολογικὸν Δελτίον* 31, 1976 (Athens 1980); E. MAMBOURY and R. DEMANGEL, Le quartier des Manganes et la première région de Constantinople. Paris 1939.

[105] MATHEWS, *ibid.* 50ff. and MÜLLER-WIENER, *ibid.* 159ff., both with extensive illustrations and references; BUCHWALD, Lascarid Architecture, 276ff. for Sikelia.

[106] MATHEWS, *ibid.* 346ff. and MÜLLER-WIENER, *ibid.* 132ff., both with illustrations and further references.

commenced at almost the same time as in the capital, and architects or building crews would have had no particular reason for seeking work elsewhere. In Asia Minor, on the other hand, building programs were diminishing because of the Turkish onslaught toward the end of the 13th century, and a general exodus by all who could get away must have taken place. Architects and building crews must have been among those fleeing the Turkish forces, and with their high level of expertise, demonstrated by the extant Lascarid buildings of Asia Minor, it is reasonable to assume that they would have been welcomed in Constantinople, as well as in other areas which were beginning to embark on new and important building programs. Similarities between the architectural production of Constantinople, Mistra, Bulgaria, or southern Serbia with that of Lascarid Asia Minor could be readily explained by a possible exodus from Asia Minor toward the end of the 13th century[107].

Although the relationship between Lascarid architecture and that of the many diverse and interesting developments within the 4th Byzantine architectural style still requires extensive further investigation, an investigation which is beyond the aims of this paper, I believe that one more observation should be made at present. The rich brick facade decoration used in the late 13th and early 14th centuries in Constantinople, southern Greece, Serbia, Bulgaria, and elsewhere occurs at least half a century earlier in Asia Minor. While there is also an earlier tradition of brick facade articulation in Constantinople and in other parts of the empire, and these traditions may have been influential during the Paleologue period, at least in Constantinople the tradition cannot have been continuous through the 13th century. I would therefore tentatively like to suggest that new impulses were brought to the capital from Asia Minor not only in attitudes toward the major architectural forms, but also in architectural decoration. The fact that the specific motifs used in Constantinople are not the same as those of Asia Minor, and that they were probably derived at least in part from earlier Constantinopolitan sources of the 11th and 12th centuries does not necessarily contradict such a hypothesis, because work crews from Asia Minor in the capital would have become familiar with, and probably fascinated by the superior models of the Byzantine past in Constantinople which were not available in Asia Mi-

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[107] VRYONIS, The Decline of Medieval Hellenism, particularly 133ff.; P. WITTEK, Das Fürstentum Mentesche. Studien zur Geschichte Kleinasiens im 13.–15. Jahrhundert (*Istanbuler Mitteilungen* 2). Istanbul 1934, *passim*; FOSS, Byzantine and Turkish Sardis, particularly 81ff.; BUCHWALD, Lascarid Architecture, 291f. for a brief summary of the advance of the Turkish forces in western Asia Minor.

nor[108]. It seems to me that it is the practice of looking at past forms, using them as models, and at least at times, casting them into new moulds, and not only the specific decorative motifs, which must be considered when comparing Lascarid architectural forms with those of other regions.

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[108] A. PASADAIOS, Ὁ κεραμοπλαστικὸς διάκοσμος τῶν βυζαντινῶν κτιρίων τῆς Κωνσταντινουπόλεως. Athens 1973, with an exemplary collection of brick masonry ornamentation in Constantinople; also BUCHWALD, Sardis Church E, 284, Fig. 17, and *passim*.

VI

LASCARID ARCHITECTURE

With ten plates

After the Latin conquest of Constantinople in 1204 the Lascarid dynasty in Asia Minor, with its center initially in Nicaea, soon gained the political and military lead among the several Byzantine states which were formed on the territory of the former Byzantine empire. With only brief intervals it retained that lead throughout the period of the Latin control of Constantinople, and expanded its territorial possessions until eventually a number of Aegean islands and large parts of what is now northern Greece and Turkish Thrace were under its control. In 1261 Michael Paleologus, who had usurped the Lascarid throne only two years earlier and had become the *de facto*, if not the rightful heir to their empire, ended the Latin occupation of the capital, and initiated the revival and final high point of the Byzantine empire which is associated with the name of the dynasty he founded[1].

The artistic and cultural achievements of the Paleologue period are relatively well known, even though the qualities of Paleologue architecture. with its unusually rich repertoire of forms, have recently unjustifiably been down graded[2]. If, as is so often the case, the political developments of the period are reflected in the arts, then the impetus of forms developed or conserved in Lascarid Asia Minor should be visible in the early monuments of Paleologue Constantinople. On the other hand, practically nothing was known until now concerning the architecture built under the Lascarids, and to my knowledge an attempt to determine its characteristics does not as yet exist. In recent surveys of Byzantine architecture the Lascarid period is hardly mentioned, a clear reflection of how little is known about it[3].

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[1] A. GARDNER, The Lascarids of Nicaea. London 1912; G. OSTROGORSKY, Geschichte des byzantinischen Staates. Munich [3]1963, 346ff.; A. VASILIEV, History of the Byzantine Empire. 2nd Engl. ed. Madison, Wisconsin 1965, 506ff., all with extensive references, among many others.

[2] R. KRAUTHEIMER, Early Christian and Byzantine Architecture. 2nd ed. extensively revised. Harmondsworth 1975, 439f., still maintains the position of the 1st ed. which was critically examined by H. HALLENSLEBEN, *BZ* 66 (1973) 128f.

[3] For instance R. KRAUTHEIMER 439ff.; C. MANGO, Architettura Bizantina. Venice 1974, 254; also V. KORAĆ, L'architecture byzantine au XIII[e] siecle, in: L'art byzantin du XIII[e] siecle. Belgrade 1967, 15; S. DUFRENNE, Architecture et décor monumental d'art byzantin à l'époque de l'empire latin de Constantinople. *Byz. Forschungen* 4 (1972) 64ff.

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This lacuna is all the more frustrating because the written sources indicate that western Asia Minor enjoyed unusual prosperity at the time, probably creating a climate in which new building programs can be expected[4]. The Lascarids themselves are reputed to have been responsible for many buildings, although very few references to specific examples are known at present[5]. Regardless of the specific testimony of the written sources, however, it is certainly not unreasonable to assume that there was a Lascarid building program, considering the atmosphere of intense competition between the 13th century Byzantine states not only in terms of military and political power, but also in terms of gaining international recognition of their imperial authority and legitimacy[6]. With an effective building program the Lascarids could demonstrate not only their wealth and power, but also their ties to the Byzantine imperial heritage of cultural leadership and building patronage. The lack of buildings adequate for imperial ceremony and imperial taste in most cities of western Asia Minor, which had been in a state of provincial poverty and deterioration for several centuries may also have given added impetus to a Lascarid building program[7].

The purpose of this investigation is to suggest how the lacuna in our knowledge of Lascarid architecture may, at least partially, be filled. The evidence available at present is insufficient to gain full insight into the dominant characteristics and the development of Lascarid architecture, and may, indeed, never be adequate because of the loss of most of the relevant monuments. I believe that there is, nevertheless, enough evidence available now to attempt to produce a tentative and incomplete picture of Lascarid architecture which is, however, as accurate and as complete as the picture we now possess of many other equivalent periods and provinces in Byzantine architecture, and which is more complete than our picture of most periods in the architectural development of Byzantine Asia Minor.

1. The Monuments

To my knowledge only three monuments built in Lascarid Asia Minor can specifically be identified with the aid of available written sources. Two are

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[4] Particularly GARDNER 263ff.; VASILIEV 546ff.; C. FOSS, Byzantine and Turkish Sardis. Cambridge, Mass. and London 1976, 76ff., each with further references.

[5] Particularly VASILIEV 546; A. HEISENBERG, Kaiser Johannes Batatzes der Barmherzige. *BZ* 14 (1905) 160ff.; also p. 263 below.

[6] This is a continuing theme throughout the accounts of the history of the period and particularly in OSTROGORSKY, ibid. passim, and VASILIEV 514ff.; also J. IRMSCHER, Nikäa als „Mittelpunkt des griechischen Patriotismus". *Byz. Forsch.* 4 (1972) 114ff.

[7] The decline of the great cities of late Antiquity in Asia Minor is well illustrated by the excavations in Sardis, summarised in FOSS, passim.

the famous imperial monastic foundations on Mount Sipylus, now Manisa Dağ near Magnesia or Manisa, probably both known under the single name Sosandra. The first, probably dedicated to Christ the Saviour, was founded by John Vatatzes, probably after his victory at Poimanenon in 1224, while the second, which was probably dedicated to the Mother of God, was founded by his wife the Empress Eirene not much later[8]. Both John Vatatzes and Theodore II Laskaris were buried in the former church[9]. Unfortunately neither remains of the buildings nor the exact location of either monastery have yet been found, although they still may be found somewhere, hidden in the crags and forests of the huge massif[10].

The third church which can be attributed to the Lascarid period on the testimony of the written sources is St. Tryphon in Nicaea (İznik), reconstructed by Theodore II Laskaris (1254—1258)[11]. This church has been associated with the remains of a church built on an inscribed cross plan which were uncovered in the town[12]. However, the remains are too fragmentary to permit a reliable attribution of the building to the 13th century, because the characteristics evident in the ruins indicate that the building could also have been constructed much earlier[13]. The church of St. Tryphon can therefore not be associated with the exposed church remains with any degree of certainty.

Because of the lack of known buildings which can safely be attributed to the Lascarid period on the basis of the written sources, the character of Lascarid architecture can at present be determined only with the aid of information concerning the history of the period, with the aid of stylistic evidence, and with the aid of evidence provided by the use of specific building technologies.

The Palace at Nymphaeum

The extensive ruins of a palace at Nymphaeum (Nif, Kemalpaşa) in the Hermus valley between İzmir and Turgutlu, which were first identified and

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[8] HEISENBERG 166ff., with references to the relevant sources, earlier literature, and an extensive analysis of the texts; A. FRONTRIER, Notes sur la geographie ancienne de l'Ionie, IV. Sossandra-Monoekos. *Revue des études anciennes* 1 (1899) 273ff.

[9] HEISENBERG, ibid; GARDNER 232.

[10] Particularly HEISENBERG, ibid. for a discussion of the location, with a critical discussion of previous attempts to locate the monastery; in an extensive search in the area suggested by Heisenberg I was unable to discover any trace of ruins, but I was not able to cover all of the area with sufficient thoroughness.

[11] I. PAPADOPOULOS, Ὁ ἐν Νικαίᾳ τῆς Βιθυνίας ναὸς τοῦ ἁγίου Τρύφωνος. *EEBS* 22 (1952) 110ff. with the relevant sources.

[12] S. EYICE, Iznik'de bir bizans kilisesi. *Belleten* 13 (1949) 37ff.

[13] IDEM 43ff. points out that stylistically the building could be attributed to the period between the late 11th and early 13th centuries. The few characteristics of the building which can be recognized could also be even earlier.

photographed in the 1870's by E. Freshfield and more recently examined in valuable publications by S. Eyice and T. K. Kirova have generally been accepted as a construction of the Lascarid period[14]. Nymphaeum is mentioned already in the early years of Lascarid rule and is known to have been a favorite residence of John Vatatzes (1222—1254), who died there[15]. There is no reason to doubt the identification of the ruin with the Lascarid residence, and there is no reason to believe that a palace would have been built there earlier. There is also no reason to doubt, on the basis of available stylistic or structural evidence, that the building could have been built in the 13th century. On the other hand, the available sources do not permit the identification of the extant remains with a specific building program[16].

The building is a simple elongated rectangle about 11.5×25.75 m in plan, its long sides facing approximately east and west, with a view along the open valley (Figs. 1—3)[17]. It does not seem to have been attached to other buildings or building parts, for its well preserved lower walls have well finished exterior surfaces on all sides and particularly at the corners. Its interior was divided into a ground floor and three upper floors. The ground floor seems to have had doors at the centers of its eastern and western sides. It is almost completely filled with fallen rubble and the form of its vaulting can therefore only be ascertained with the aid of excavation; its heavy construction, tiny windows, and apparent lack of wall pilasters could mean that it was covered by a barrel vault[18]. The first floor was divided into three

[14] E. FRESHFIELD, The Palace of the Greek Emperors of Nicaea at Nymphio. *Archaeologia* 49 (1886) 382ff.; S. EYICE, İzmir yakınında Kemalpaşa (Nif) da Laskaris'ler Sarayı. *Belleten* 25 (1961) 1 ff.; idem, Le palais byzantin de Nymphaion pres d'Izmir, in: Akten des XXI. internationalen Byzantinistenkongresses. Munich 1960, 150ff.; T. K. KIROVA, Un palazzo ed una casa di età tardo-bizantina in Asia Minore. *Felix Ravenna* 103—104 (1972) 276ff., all with the relevant sources and extensive photographs.

[15] Particularly C. FOSS, Late Byzantine Fortifications in Lydia, below, p. 310; also FRESHFIELD 385; EYICE, Le palais, 150; IDEM, İzmir 2f.; KIROVA 277f., 294f.

[16] FOSS, ibid., fn. 45, points out that a mid-13th century source mentions a synod held *in John Vatatzes' palace at Nymphaeum*. While available stylistic evidence permits an attribution of the palace to Vatatzes (p. 285ff. below) the textual evidence here is not as firm as for the three buildings mentioned above, for it does not state specifically that the building was constructed during Vatatzes' reign. Because Vatatzes was alive when the text was written, the palace would have been *his* at the time of writing even if it had been built earlier. Strictly speaking, therefore, the text serves as a *terminus ante quem* (1250), assuming that the palace refered to is the one now standing.

[17] My observations on the building were made in 1972 and 1973, but I was unable to make a measured plan, and the dimensions given here are taken from EYICE, İzmir, 4.

[18] I do not believe that the heavy wall pilasters and columns shown in previously published plans can be demonstrated on the ground floor without excavation. The central bay of the ground floor was covered by a complex vaulting form the seat of which can be traced above the door in the eastern wall (Fig. 2 and KIROVA, Fig. 5).

roughly equal parts. The central part was clearly covered by a groined vault. The lowest bricks of the vault are extant at the north west pillar of the bay, set almost vertically, but their upper ends tipped slightly outward, a form which is not usual in pendentives or arches, in which the lowest bricks are usually almost horizontal (Fig. 24). The large arch on the inside of the eastern wall of the central bay, and the lack of a wall pilaster in the same location also demonstrate that the entire central bay was covered by a single vaulting solution (Fig. 2). The northern and southern parts of the first floor are each subdivided into two bays by wall pilasters between the two windows in their eastern and western walls. The scant remains of the vaults which they carried can best be interpreted as large barrel vaults which spanned east-west, which were intersected by smaller, lower vaults spanning north-south between the pilasters. The single arch which spans the entire south wall on the interior clearly demonstrates that these flanking bays were spanned east-west without interruption by an intermediate support (Kirova, Fig. 6).

A monumental stair case was located on the north side of the building, parallel with the north facade. Remnants of its complex vaulted supports are extant at different intermediate heights in the north western and north eastern corners of the palace, leaving no doubt about its original location and its general forms[19]. The use of heavy wall pilasters between the windows of the second floor and remnants of a groined vault or another similar vault form above the pilaster between the two southern windows of the west wall indicate that the second floor was also vaulted. However, the lack of height in the vaulting zone of the second floor demonstrates that the vaults were not as spacious as those over the first floor, and that they must have been supported by intermediate columns or pillars. The extant remains of a large opening in the center of the western facade imply that the central bay contained a unified spacial, and probably also vaulting solution at this level corresponding with that of the first floor (Fig. 1)[20]. The lack of pilasters at the third floor level probably implies that these walls did not carry vaults, and that the roof was

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[19] EYICE 5, Fig. 13; KIROVA 284, Fig. 6, with whom I cannot fully agree, because the evidence is incomplete, making a reconstruction with closed walls on both sides of the staircase questionable. Also, I do not believe that the form of the staircase can be explained by the supposed defensive character of the palace. The location of the sloping barrel vault of the staircase well above the vaulting level of the first floor at the north western pillar may indicate that the staircase consisted of two parallel flights between the first floor and the second, one above the other, making a comfortable riser: tread relationship possible in spite of the excessive floor height.

[20] The single remaining vault remnant clearly spanned east-west, but the seat of an additional vault which may have spanned north-south is also visible. A mixed construction of arches and timber may also have been used in some places. Accurate measurements of all

constructed of timber. The straight horizontal upper edge of the extant masonry, which is clearly visible in Freshfield's photographs and can still be traced in some places indicates that the building was never higher than its highest extant parts.

Many of the original features of the exterior are still visible and relatively little has been lost since Freshfield's photographs were made. All four facades are characterized above all by their pure geometric simplicity, each side being formed of a single flat plane broken neither by cornices nor by arcaded articulation, but only by the unusually regular fenestration and by the alternation of ashlar masonry and brick (Fig. 1)[21]. The over all impression is one of extreme elegance.

The ground floor zone seems to have been pierced only by a single door in the center of each long side, and by tiny slit-like windows. On the east the first floor is articulated by six windows which seem to have been equal in size and equidistant from each other. On the west there are also six windows on this floor, but while the two northern and two southern windows appear to be of the same size as, and exactly opposite those of the east facade, the two central windows are larger and closer together, and apparently formed a bifora with a column or narrow pier between them (Fig. 1, 3). Two windows which were apparently somewhat larger than the standard windows of the east and west facades articulated the south facade, but the fenestration of the north facade has not been preserved. In those parts of the second floor which have been preserved the fenestration was almost the same as in the first floor, except that the windows seem to have been slightly lower. While the west facade is relatively well preserved, not enough of the central opening remains to distinguish its specific forms, and the south facade is almost entirely destroyed at this level. Only small portions of the east facade are still extant, but they are sufficient to recognize windows roughly equal in size as, and on the axes of those of the first floor. Extensive remains of the third floor are extant only on the west facade, and here, too, the openings seem to correspond with those below them (Fig. 1)[22]. The complete lack of extant masonry at the third floor level of the east facade could be interpreted to mean that it was supported by a colonnade, although it can also be explained as an accident of preservation.

remaining vault fragments, possible only with the aid of scaffolding, is essential in determining the vaulting scheme and details. Excavation of the interior could also provide valuable information, not only for the ground floor, but also for the upper vaulting system, for large pieces of the vaults may still exist in the rubble, as they did in the excavation of Sardis church E (fn. 28 below).

[21] Particularly FRESHFIELD, Pl. p. 386, 388; EYICE, İzmir, Fig. 1—5; IDEM, Le palais, T. XXVI—XXIX; KIROVA, Fig. 1—3.

[22] FRESHFIELD, Pl. p. 388; EYICE, T. XXVII; KIROVA, Fig. 1.

The edges of the window openings do not seem to have had profiles, for no trace of profiles remains around the openings, even though the masonry near some of them is relatively well preserved. On the other hand, above the northern side of the first floor bifora in the west facade there is a short vertical section of a rounded profile, similar to an engaged half column set slightly into the surface of the facade. It is made entirely of cut bricks (Fig. 22). However, corresponding profiles exist neither in the relatively well preserved masonry on the other side of the bifora nor elsewhere in the facade. The profile does therefore not seem to have been an important articulating feature and its use may, perhaps, have been discontinued[23].

Rather, the dominant decorative feature of the facades is the unusually pronounced striped effect created by the use of alternating layers of dark red brick and light grey ashlar (Fig. 1). Only the ground floor, up to the sills of the first floor windows, is entirely faced with well squared, perhaps reused ashlar blocks in regular horizontal courses. The masonry facing of all other parts of the facades consists of alternating layers of brick and ashlar which differs from earlier Byzantine examples built in a similar manner above all because of its strikingly bold visual impact[24]. This impact is achieved by the combined use of the following characteristic details: 1) a particularly strong color contrast between the brick and ashlar; 2) the regularity of the horizontal bands, which are continuous around all sides of the building except where they are interrupted by the fenestration; 3) the low height of the horizontal bands, which measure only about .50—.60 m in the first floor zone and diminish slightly toward the top of the building; 4) the uniformity in the heights of all the bands, both those of brick and those of ashlar. Four courses of brick are usually used in each brick band, and the ratio of the height of the individual bricks to the height of the horizontal morter joints is close to 1 : 1. Occasionally vertically placed bricks are used between the ashlar blocks and with small additions they are sometimes transformed into characters similar to the letters of the Greek alphabet (Fig. 23)[25]. The vertical bricks are not used frequently enough to obtain the effect of "cloisonné" masonry, and characters similar to those of the Kufic script do not seem to have been used at Nymphaeum[26].

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[23] I was unable to find the frieze of vertical bricks mentioned by EYICE, Izmir 7, unless the occasional vertical bricks mentioned below are meant.

[24] Also p. 289f. below.

[25] EYICE 7, Fig. 14; IDEM, Le Palais, 153, T. XXIX—4.

[26] A. MEGAW, The Chronology of some Middle Byzantine Churches. *ABSA* 32 (1931—1932) 102ff.; also G. SOTIRIOU, Ἀραβικαὶ διακοσμήσεις εἰς τὰ βυζαντινὰ μνημεῖα τῆς Ἑλλάδος. *DChAE* (Praktika) III 2 (1933) 57 (also in *BNJ* 11, Heft 3—4 [1935] 233) and G. MILES, Classification of Islamic Elements in Byzantine Architectural Ornamentation in Greece, in:

The palace walls seem to have been constructed entirely of rubbled mortar faced on both sides with brick and ashlar. The interior facing frequently consists of single courses of brick which alternate with single courses of ashlar (Fig. 2). The vaults and arches seem to have been constructed entirely of brick similar in character to that used in the facades. Cavities in many parts of the masonry indicate that an extensive system of tie beams or timbers was used to strengthen the fabric of the building (Fig. 2). The timbers can be traced best, both parallel with and perpendicular to the exterior walls, at the level of the first floor, just above the vaulting of the ground floor. Clay pipes, some ending at the face of the facade, can also be traced in several places, particularly at the level of the first floor, suggesting that provisions for sanitary facilities of some sort existed in the building (Fig. 22, upper left)[27].

Sardis Church E

In a recent investigation I demonstrated that the concurrence of historical, archeological, and stylistic evidence permits the attribution of church E at Sardis, a little over 50 km east of Nymphaeum, to the 13th century, and that the building was most probably built during the Lascarid period[28]. It is not necessary to repeat either the description or the arguments concerning the reconstruction and dating here, because they are given in considerable detail in the publication.

Latmos Church 8

In the same investigation I pointed out that some of the decorative fassade details of the largest church on Kaiwe Asar Adası, an island off the south shore of Lake Latmos (Bafa Göl) between Ephesus and Milas, have close similarities with distinctive details in Sardis E, and that the two churches were therefore probably built during the same general period by builders working in a similar provincial idiom[29]. For the sake of convenience I will use the designation of the church given in Wiegand's final plan summary,

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Actes du XII^{e} Congrès International des Etudes Byzantines. Belgrade 1964, III, p. 281 ff., both with less emphasis on masonry ornamentation. Bricks cut into the shape of letters do not seem to have been used at Nymphaeum.

[27] Fn. 28, 274 f., Fig. 4, 9 for a more detailed description of a similar system of tie beams and possible reasons for its use; the systems used in Nymphaeum and Sardis appear to be exactly comparable even in the specific locations of beams and details. KIROVA, Un Palazzo. 290 suggests that the clay drain pipes served to chanel rain water into cisterns, a tempting hypothesis which must be discounted for those drains which opened directly onto the facade.

[28] H. BUCHWALD, Sardis Church E — a Preliminary Report. *JÖB* 26 (1977) 265 ff.

[29] IDEM 287, 289, Fig. 19, 20.

"Latmos church 8", rather than the awkward term used until now, which is taken from his text[30].

The church was built on the inscribed cross plan, with four columns or pillars supporting the major dome (Fig. 5)[31]. Unlike Sardis E the major apse is attached directly to the eastern cross arm without an intermediate bay, and the plan of the church was apparently not designed in accordance with the *quadratura*, but rather, with its sides in the proportion $1 : \sqrt{2}$ [32]. The corner bays of the naos are covered by barrel vaults which span north-south, while the three bays of the narthex are covered by barrel vaults which span east-west (Fig. 13). The narthex, which had a gallery approached by an exterior stairway from the north, may have been a later addition, because its walls are not bonded with those of the naos (Fig. 10)[33]. The open archways between the bema and the flanking spaces are reminiscent of the similar solution in Sardis E, but they produce a sense of symmetry about the north-south axis of the naos which is not found in Sardis[34].

On the exterior the major apse has seven sides while each flanking apse has three. Five sides of the major apse and all sides of the flanking apses are each articulated by a small high window framed by two concentric recessed

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[30] T. WIEGAND, Der Latmos (Milet 3/1). Berlin 1913, 42ff.; my observations were made in 1972. At that time portions of the lateral vaults and of the narthex walls shown in Wiegand's photographs had fallen, but the remaining fabric of the building was still preserved.

[31] There is no evidence to support WIEGAND's reconstruction of an eight sided drum with squinches. The reconstruction in his Fig. 66 is also erroneous in that it fails to show the low, windowless clerestory walls portions of which are still extant flanking the eastern and western major arches.

[32] Fig. 4, 5; BUCHWALD 271f.; the proportion $1 : \sqrt{2}$ is obtained by dimensioning the long side of the church equivalent to the diagonal of a square with its sides equivalent to the length of the short side. If the eastern side of the square is set at the eastern face of the flanking walls, then the western side of the square also defines the western edge of the naos. The dimensions used to obtain the construction are taken from WIEGAND's plan Fig. 65, and were not controlled in the church itself. Although the construction does not fit the plan with complete accuracy, it fits closely enough to be convincing, considering possible inaccuracies in the measurement of the church, in the drafting and reproduction of WIEGAND's Fig. 65, and above all in the construction of medieval buildings. Inaccuracies of several centimeters are usually found in modern buildings, built with all of the aids of modern surveying equipment and contemporary building technology.

[33] WIEGAND 48, Fig. 68, who states clearly that the building was constructed in a single operation. Although some of the lowest ashlar blocks of the flanking facades project westward beyond the western face of the western naos wall, there is an obvious vertical joint between the flanking walls of the naos and the narthex, and the masonry is slightly different in character in the narthex facades. The narthex was therefore probably planned together with the church, but built slightly later than the naos.

[34] BUCHWALD 266f.; cf. also p. 281 below. In this respect Latmos 8 seems to be more traditional than most of the buildings in our group.

brick arches, and those of the major apse also by a brick dentil frieze (Fig. 11)[35]. The three central faces of the major apse and the center faces of the flanking apses are also each articulated by a tall lower window which is also framed by two concentric recessed brick arches. Above the arches of the higher windows in the major apse there is a brick double meander frieze, one meander above the other, similar to that used in one of the Sardis domes[36]. In contrast to the Sardis meander band, however, the vertical members of the upper meander in Latmos church 8 correspond with every second, rather than with every member of the lower meander, creating a more complex and stronger rhythm and an individualisation of each meander unit.

Both the northern and southern facades of the naos of Latmos church 8 are articulated by three blind arcades which reflect the three bays of the structural solution generally though not in detail (Fig. 10, 12)[37]. The arcades are recessed twice above the spring lines of their arches, but only once below, and are constructed of cut stone voussoires which usually alternate with two or more bricks. A small window framed by two concentric recessed brick arches is located in the flanking bays of the southern, but not of the northern facade. The central bay is well preserved only in the northern facade. It was pierced by a single large window in the lunette which rested on the arches of a broad opening which seems to have been a triple window[38], which in turn apparently was located above a doorway in the center of the bay. While the triple window is framed by recessed brick arches and a dentil frieze, the lunette window is framed by recessed arches built of brick and occasional stone voussoires without a dentil. A single meander frieze decorates the lunette on both sides of the window. It is different from those used in Sardis E in that the horizontal bricks which close the meander on the top and bottom are not used in every consecutive meander unit, but only in every second unit, thereby breaking the continuity of the meander and forming individual units which, like those of the double meander on the Latmos apse, have a stronger sense of rhythm[39]. A chevron frieze like that found on the northern apse of Sardis E decorates the lunette above the western, but not the eastern section of meander (Fig. 12)[40]. Roundels composed of a round cavity enclosed by radial bricks are found at the top of the lunette on both sides of the window,

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[35] Also BUCHWALD, Fig. 19; WIEGAND, Figs. 64, 65, 69.

[36] BUCHWALD 269, Figs. 11, 12, and p. 286ff., as well as p. 286 below.

[37] Also WIEGAND, Fig. 62.

[38] The solution suggested in IDEM, Fig. 66 seems less plausible and contains a number of errors and unlikely reconstructions.

[39] BUCHWALD, Fig. 20.

[40] IDEM 269, 293, Fig. 16.

and also near the tops of the lunettes of the flanking arcades in the south facade (Fig. 27)[41]. The upper part of the lunette of the western arcade in the north facade was decorated by a pattern of brick lozenges the centers of which are hollow, and were probably originally filled with mortar (Fig. 26). The pattern is poorly preserved and seems to have been repaired with small stones and masonry of brick and ashlar.

The three facades of the narthex do not seem to have been articulated by blind arcades comparable to those of the naos facades (Fig. 10)[42]. A small niche with a stepped plan and brick conch crowned by two concentric recessed brick arches flanked the major door in the western facade on both sides. There is also a small window with a brick arch in the northern part of the west facade, and an arched doorway in the southern facade of the narthex[43].

Most areas of the facades which were not decorated with brick ornamentation were faced with alternating courses of brick and ashlar reminiscent of the Nymphaeum facades in general, but not in detail. While the courses are regular and continuous in some areas, for instance in the apse zone below the brick arcades and on the eastern side of the south facade, in other areas they are less regular and at times interrupted by oversized ashlar blocks (Fig. 10, 11, 27)[44]. The courses are generally less regular in the narthex facades, although the same general application of alternating brick and ashlar courses was used here as well. Vertical bricks between the ashlar blocks are used only rarely in the facades of the naos, but are somewhat more common in the narthex walls, where characters resembling those of the Greek alphabet, like those of Nymphaeum, were also used occasionally (Fig. 25).

Most of the brickwork in Latmos church 8, including that of the narthex and the decorative arcades is unusual in that the mortar joints between the bricks are filled with narrow, often broken bricks and brick chips with their outer faces just underneath the surface of the mortar (Fig. 26, 27). The mortar is still extant in some places, its outer face hardly recessed behind the outer faces of the visible bricks. This technique is the same as that used in the decorative brickwork, but not in the arches of Sardis church E[45], and resembles the recessed brick technique common in Constantinople and other

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[41] Also WIEGAND, Fig. 62, 66; p. 285 below.

[42] IDEM, Fig. 62, 63; nothing of the upper southern narthex wall remained in 1972, making it impossible to confirm or reject the reconstruction in WIEGAND's Fig. 66.

[43] Clearly visible in IDEM, Fig. 62, but incorrectly shown as a window in the reconstruction of Fig. 66; the crude opening in the northern narthex wall may, however, have originally been a small window.

[44] WIEGAND, Fig. 62—64.

[45] BUCHWALD 268f., Fig. 12, 13.

areas in the 11th and 12th centuries[46]. The ratio between the heights of the bricks and those of the mortar joints, however, is only about 1 : 1 at Latmos, much closer than is usual in recessed brickwork, and approximately the same as that obtained at Nymphaeum without the use of brick filled mortar joints. The purpose of the brick filled mortar joints at Latmos may therefore have been a reduction in the required amount of mortar, rather than an encrease in the apparent height of the mortar joint.

The structural techniques used in Latmos church 8 resemble those of Sardis E and Nymphaeum. The church seems to have been built entirely of rubbled mortar faced on both sides with ashlar and brick. In contrast to Sardis and Nymphaeum the interior facing and the vaulting consist almost entirely of ashlar and field stones, with brick used only intermittently, but this difference can probably be explained by the necessity, at Latmos, of transporting the brick across the water, from ancient Heracleia[47]. As at Sardis and Nymphaeum the masonry of Latmos church 8 was strengthened by an extensive system of timber tie beams which can be traced particularly well at the level of the springing of the lower arches and immediately above the lower arches, near the spring lines of the major barrel vaults (Fig. 13)[48].

Latmos Church 4

The forms of two other Latmos churches can be related to those of Latmos church 8, and these two churches were probably also built during the same general period.

Latmos church 4, the Church of the Virgin on İkis Ada, an island off the northern shore of Lake Latmos is very poorly preserved and the forms of its plan, vaulting, south facade, and apse solution are conjectural (Fig. 6)[49]. Its north facade and narthex, however, are relatively well preserved. The north facade was articulated by three blind arcades, the western arcade somewhat

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[46] Recessed brickwork as a criteria for dating 11th and 12th century buildings was first suggested by N. BRUNOV, Die Odalar-Djami von Konstantinopel. *BZ* 26 (1926) 360f.; H. SCHÄFER, Architektur-historische Beziehungen zwischen Byzanz und der Kiever Rus im 10. und 11. Jahrhundert. *Istanbuler Mitteilungen* 23—24 (1973—1974) 197ff. provides a summary of the available material. — See also P. L. VOCOTOPOULOS p. 245ff. Supra.

[47] WIEGAND 43f. suggests that all the building material was brought from ancient Heracleia.

[48] BUCHWALD 270; the construction of Sardis E will be dealt with in greater detail in the Final Report which will be published in the *Archaeological Exploration of Sardis* series.

[49] WIEGAND 30ff., Fig. 45—50, who calls the church the "main church of Ikis Ada". My term Latmos church 4 is taken from WIEGAND's final plan summary, titled "Beilage 6 zu Seite 96". The dedication of the church is given in an inscription on the lintel of the major portal (WIEGAND, p. 35ff.). It seems best to ignore most features of the reconstructed plan of the church in Fig. 47 until an excavation of the building provides more information about its interior organization.

larger, and the eastern somewhat smaller than the central arcade (Fig. 31). Small windows were located near the spring lines of the arches. Both the blind arcades and the window arcades are composed of two concentric recessed arches, the inner arch built entirely of brick, while the outer arch is built of stone voussoires which alternate with brick. A brick dentil is used around the outer arches of the windows. Brick roundels similar to those of Latmos 8 are located near the tops of the extant lunettes and in the center of the spandrel between the two extant arches. Small symmetrically ordered plaques also decorate the western lunette on both sides of the roundel. Below the spring line the pilasters of the blind arcades are recessed only once, and pilasters also occur between the windows. Here the masonry facing consists entirely of horizontal ashlar courses which alternate with one or two courses of brick. The ashlar blocks, and also the stone voussoires are much more regular in size and more carefully cut than those of Latmos church 8, and the use of bricks in the vertical joints of the ashlar courses seems to have been more common.

As in Latmos 8, the narthex of Latmos church 4 was a later addition[50]. The narthex was divided into three bays which were vaulted by groined vaults, and like Latmos 8, it had a gallery. While the original western facade of the church seems to have been articulated by blind arcades like those of the north facade[51], the narthex facades seem not to have had arcaded articulation, again permitting a comparison with the narthex of Latmos 8. The Latmos 4 narthex facades were articulated only by windows on the north, south, and on both sides of the major portal. The arches of the portal and of the windows seem all to have been constructed in the same way as those of the naos north facade. The masonry facing seems also to have had the same character as that of the naos north facade, except that brick is hardly used below the spring lines of the window arches. These similarities indicate that the narthex was probably not built very much later than the naos.

The marble lintel over the narthex portal is carved with an arcade with alternating crosses and palmettes underneath the arches[52]. An inscription on the lower fascia, which names the *Panaghia Pantanassa* as patron of the church, and the monk Methodius as its builder, has tentatively been dated to the 13th century on the basis of paleographic evidence[53]. The lintel was

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[50] IDEM, 33f.; the vertical joint between the naos and narthex observed in the text and just visible in Fig. 50 is ignored in the elevation of Fig. 46 and incorrectly shown in the plan of the same Fig.

[51] IDEM, Fig. 46, plan and section looking east.

[52] IDEM, 35, Fig. 48—49.

[53] IDEM, 38ff., attributes the inscription to the second half of the 13th century, an attribution which complies with the dates suggested by the stylistic development of the architecture and history of the area (p. 291 below).

probably originally part of an epistyle of an altar screen, and seems to have been a reused spoil, for the arcade at its northern end seems originally to have continued beyond the edge of the lintel[54]. The inscription could have been applied at the time the epistyle was reconditioned for its present use, although it could also be older[55].

A system of wooden tie beams was used in the masonry of Latmos church 4, as in all of the other building described above[56].

Church Fragment at Eğri Dere

A fragment of the western facade is all that is known at present of a church ruin at Eğri Dere, several kilometers north west of ancient Heracleia on Lake Latmos (Fig. 14)[57]. The facade was articulated by blind arcades built with two concentric recessed brick arches. Inside the arches of the arcades a door and window are also constructed with two concentric recessed brick arches. Below the spring lines of the arches, all of which spring from the same level, the pilasters of the blind arcade are recessed only once. Here, and in the lunette between the door and the blind arcade, the masonry facing is constructed of well cut ashlar blocks in regular horizontal courses, with a single brick course usually between the ashlar courses, and vertically placed bricks in most of the vertical joints. A brick roundel decorates the spandrel between the arches of the blind arcade. The brickwork in the arches is constructed using brick filled mortar joints similar to recessed brickwork, as described in Latmos church 8. Similarities such as these, as well as the general similarity in articulation permit the attribution of this facade fragment to the same general period as Latmos churches 4 and 8[58].

The Church of the Panaghia at Krina, Chios

Several churches on Chios are also similar to the churches described above. The most important, and perhaps most similar is the very impressive, and very attractive church dedicated to the Virgin at Krina, between Vavyloi

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[54] IDEM, Fig. 48; similar lintels have been found in a number of excavations in western Asia Minor, for instance at Sardis, Aphrodisias, and Xanthos and are well known in southern Greece in examples datable to the 11th and 12th centuries.

[55] Theoretically the inscription could have been applied to the lintel at any time. But if the inscription is, indeed, to be dated to the 13th century, then the narthex can hardly be much later than the inscription for historical reasons which are given below (p. 291 f.).

[56] WIEGAND, 33.

[57] IDEM 60, Fig. 82.

[58] IDEM 29, Fig. 35, 38 shows a chapel at Jediler, on Lake Latmos east of Heracleia (Latmos church 20) which also has some of the general features of the other churches. However, the lack or brick ornamentation, the lack of stone voussoires which alternate with bricks, and the lack of arches recessed twice probably indicate that the chapel should be attributed to a somewhat earlier date.

and Sklavia (Fig. 7, 18—21)[59]. Its plan is not similar to that of Sardis E or the Latmos churches, but is rather essentially the same as that of Nea Moni on Chios, with the naos covered by a single large dome on pendentives which are interrupted by exedral niches at the corners, producing an approximately octagonal plan in the vaulting zone. The exterior dimensions of the plan, without the apse, are about 8.25 × 16.70 m, somewhat smaller than Sardis E, and almost exactly 1 : 2[60].

The major and flanking apses have three sides on the exterior, and are articulated by blind arcades recessed once or twice which are organized in two stories. Three windows of equal height divided by columns or pillars are located in the central apse, while each flanking apse had a single window. A meander frieze composed of two interlocking strands decorates the central apse above the blind arcades. The lunettes of the upper arcade are decorated by bricks set at an angle, producing an inverted "V" pattern reminiscent of the herringbone brickwork used in the same location in Sardis church E[61].

The flanking facades are also articulated by blind arcades recessed once or twice. While some of the arches generally reflect aspects of the interior organization of the church, others, for instance those of the narthex and bema zones, have no relationship to interior features. The organization of the central zone is similar to that of the corresponding facade area of Nea Moni, the similarity being underscored by the exedral forms of the upper flanking arcades (Fig. 20)[62]. Each of the single and binate windows which fenestrate the flanking facades is enclosed in an additional recessed blind arcade. A meander like that used in the apse decorates the central lunettes below the spring lines. The centers of these lunettes are decorated by large quatrefoils with recessed centers which are flanked by a chevron on both sides. Other lunettes contain lozenge and basketwork patterns and brick courses set at an angle in a "V" pattern. Individualized units of a meander are also used at the tops of the central lunettes, and a pattern of scales, as well as simple "T"s are used occasionally in the spandrels between the arches. Single and binate miniature blind arcades occur in numerous places in the spandrel zones. A stone cornice with a simple raking profile marks the spring lines of the major arches. Two parallel friezes of hollow clay quatrefoils are located above the three upper arches of the central portions of the flanking facades, and under the roof line of the narthex (Fig. 28).

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[59] C. BOURAS, Chios. Athens 1974, 30ff.; A. C. ORLANDOS, Monuments Byzantins de Chios. Athens 1930, II, Pl. 31—36. My own photographs and observations were made in 1960.

[60] The dimensions are taken from ORLANDOS, ibid. Pl. 32. The comments regarding the accuracy of dimensions in Fn. 32 above are relevant here as well.

[61] BUCHWALD, Sardis 268f., 289f.

[62] Compare BOURAS, Fig. p. 56; ORLANDOS, Pl. 12, 31, 34.

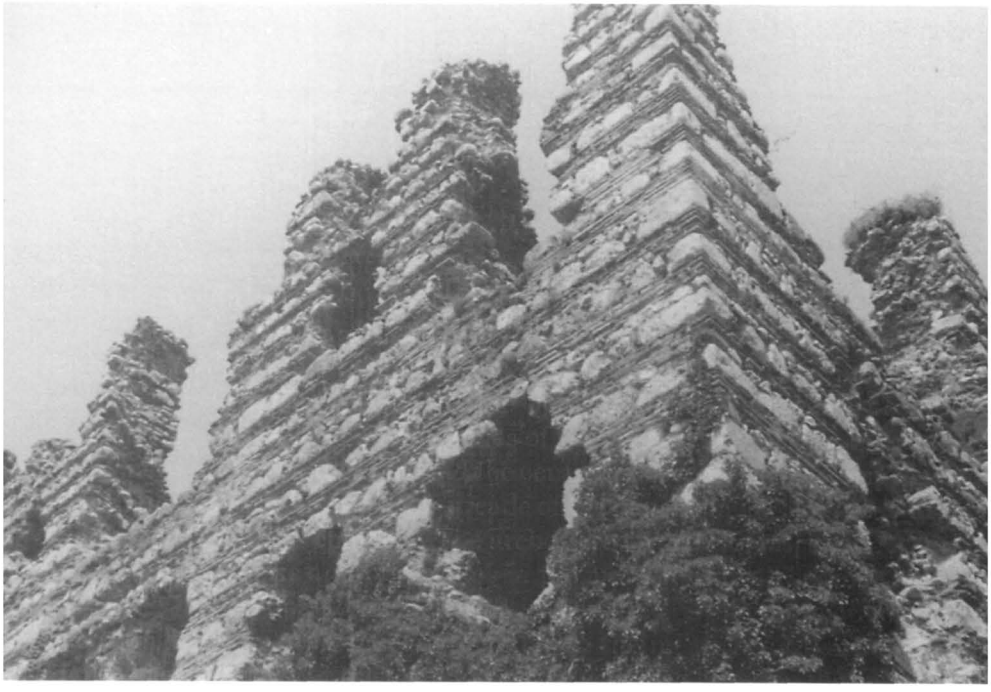
The major dome, which is only partially preserved, the facade ornamentation, all of the facade arches, and most of the surrounding masonry facing are built entirely of brick, while the lower areas of the facades are faced with well cut ashlar blocks in regular horizontal courses which alternate with several courses of brick at regular intervals. The ratio between the heights of the ashlar courses and those of the brick bands is usually close to 1 : 1, the same as in the palace at Nymphaeum. Only in the walls of the narthex are the ashlar courses less regular, and roughly hewn field stone is used here occasionally in place of the well squared ashlar blocks. All of the brickwork in horizontal courses appears to be constructed in the recessed brick technique, with mortar joints which are sometimes two, but more often three and four times as high as the adjacent, relatively narrow, bricks. One or two bricks are occasionally set vertically into the joint between two ashlar blocks, and in some places there are additional brick members, giving them the form of characters of the Greek alphabet (Fig. 18).

The Church of the Panaghia at Sikelia, Chios

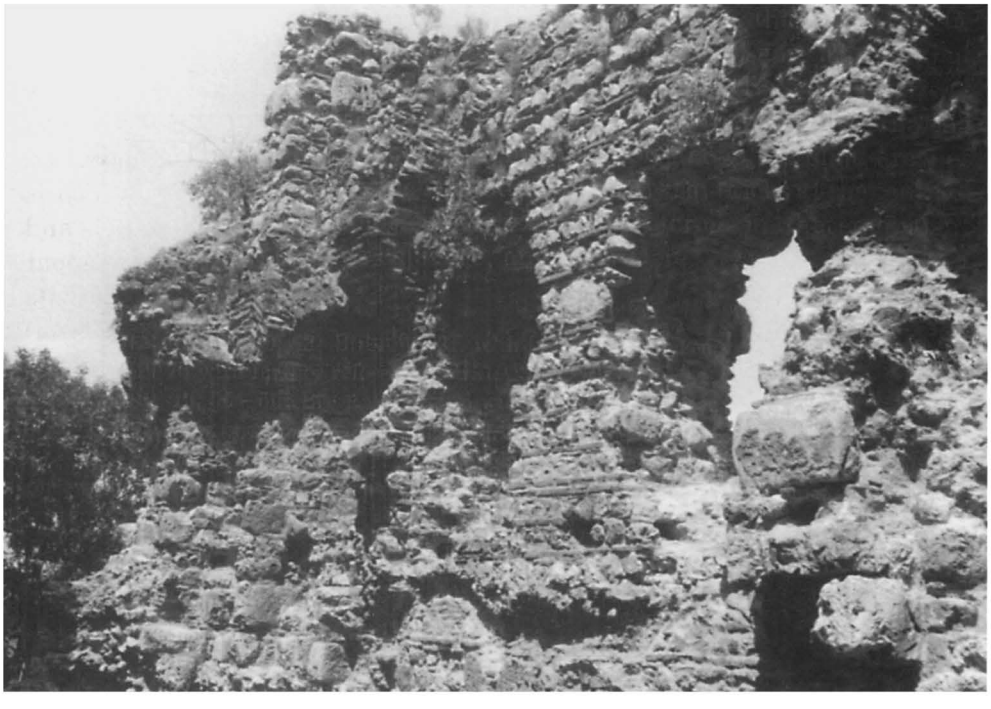
The church of the Virgin at Sikelia, between Tholopotami and Kalamoti on Chios is smaller and less monumental than Krina, but equally well preserved and also related to the churches of our group (Fig. 8, 15—16)[63]. The plan and vaulting scheme are similar to those of Sardis E in that elements of the inscribed cross church type are combined with those of a basilical solution, even though specific features are abbreviated at Sikelia and not similar in detail. At Sikelia the major dome is supported on pendentives which are carried by four arches equal in span and height. However, while the arches on the major axis of the church continue as the barrel vaults over the bema and the single nave, the lateral arches end as blind arcades, a motif which is repeated in reduced form as wall niches in the flanking walls of the bema and the nave. The exterior dimensions of the plan, excluding the apse, are about 5.50 × 13.30 m, an indication that the building was probably designed with its sides proportioned as the ratio between the side of a square (5.50 × 5.50 m) and the side of the same square plus its diagonal[64].

[63] IDEM Pl. 43—48; BOURAS 34ff.

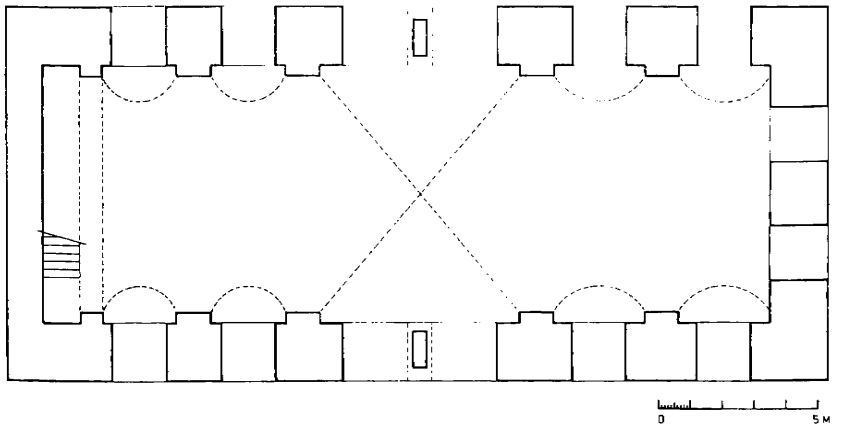
[64] The dimensions are taken from Orlandos, Pl. 44; while the comments regarding the accuracy of the dimensions in Fn. 32 above are also relevant here, the construction fits the plan so well that there can be little doubt about its use. Other proportional dimensions of the church include the height of the nave measured to the top of the vault, which is twice the width of the nave measured to the inside faces of the wall pilasters, and the height of the nave measured to the spring line of the vault, which is equal to the width of the nave measured to the rear faces of the wall niches.



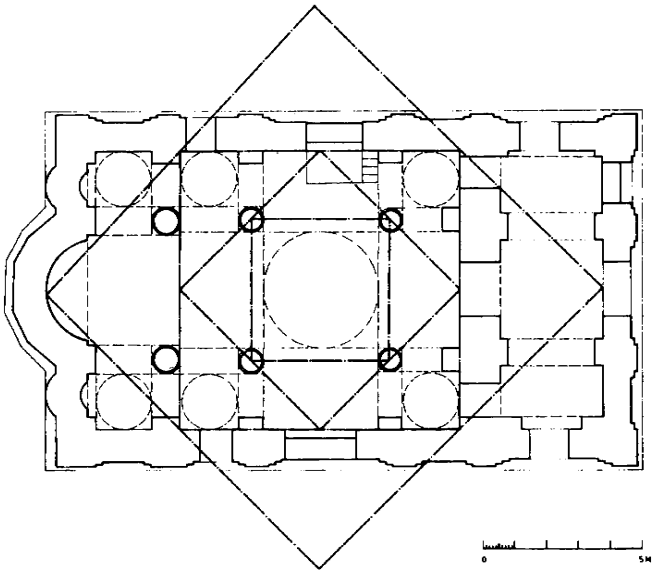
1. The Palace of Nymphaeum from the South West (1972)



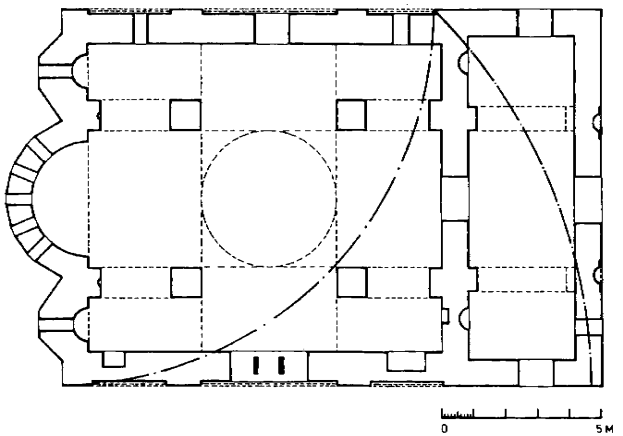
2. The Palace of Nyphaeum, Interior looking North East (1972)



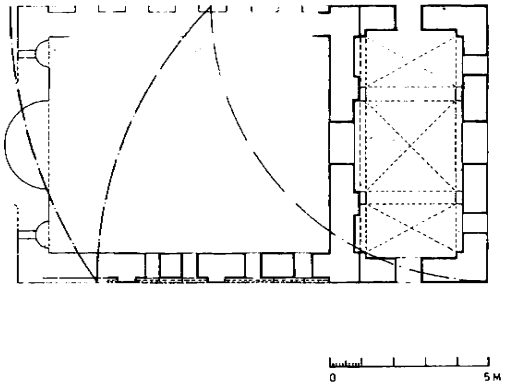
3. The Palace at Nymphaeum, First Floor Restored Plan



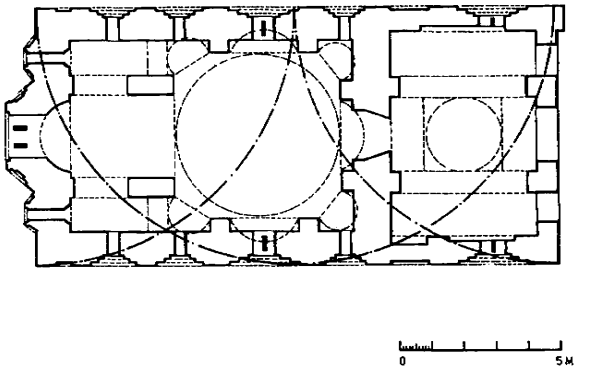
4. Church E at Sardis, Restored Plan with Quadratura Construction



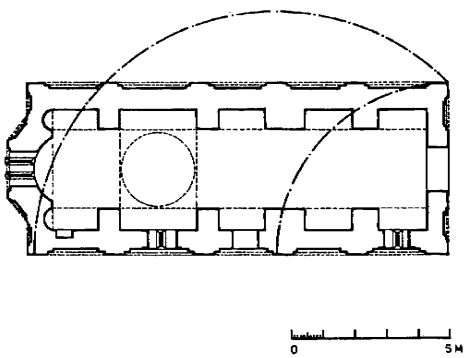
5. Latmos Church 8 (Kaiwe Asar Adasi) Plan with $\sqrt{2}$ Construction



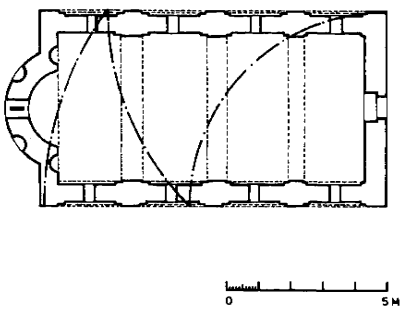
6. Latmos Church 4 (Ikis Ada) Plan with $\sqrt{3}$ Construction



7. The Church of the Virgin at Krina, Plan with 1 : 2 Construction



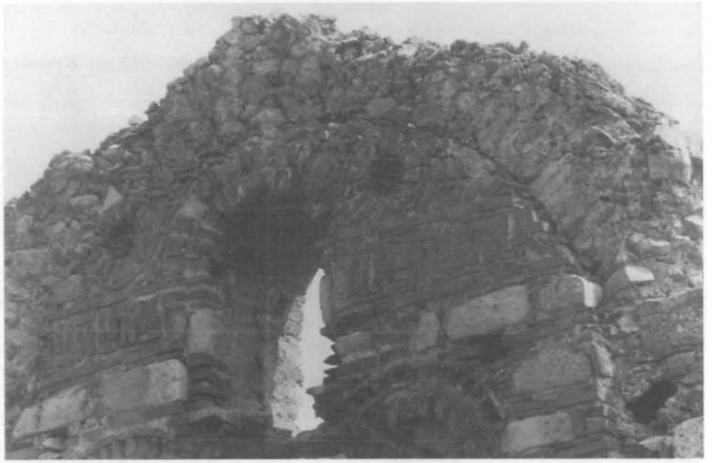
8. The Church of the Virgin at Sikelia, Plan with $1+\sqrt{2}$ Construction



9. The Church of St. John at Chalkios, Plan with $\sqrt{3}$ Construction

10. Latmos Church 8 (Kaiwe Asar Adasi) from the South East (about 1906)

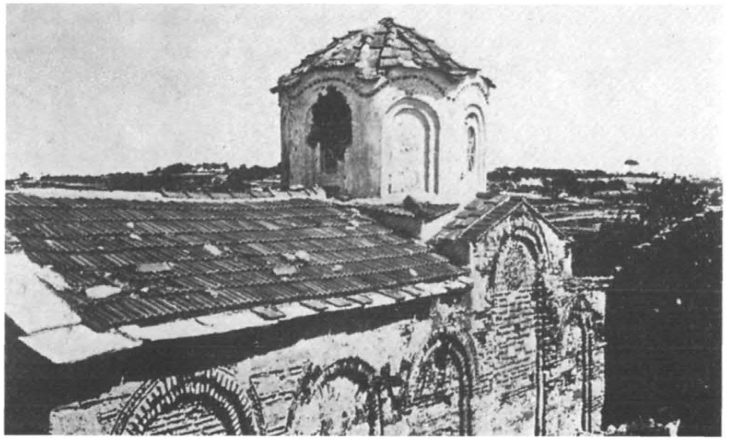
11. As 10 from the East (about 1906)



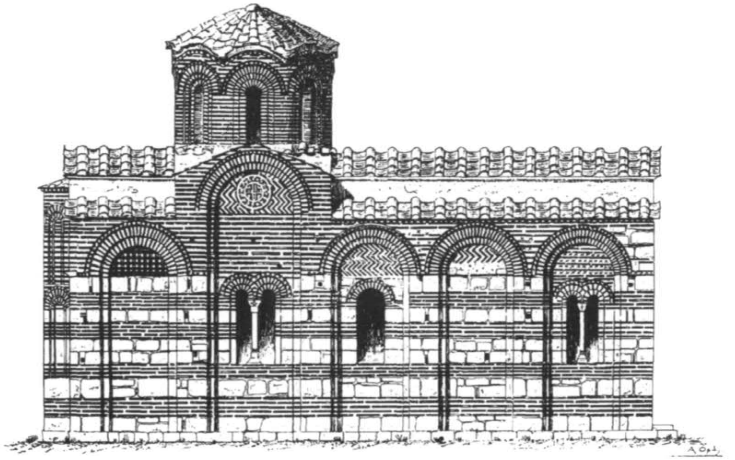
12. As 10, the Major Arch of the North Facade (1972)

13. As 10, Interior looking North East (1972)

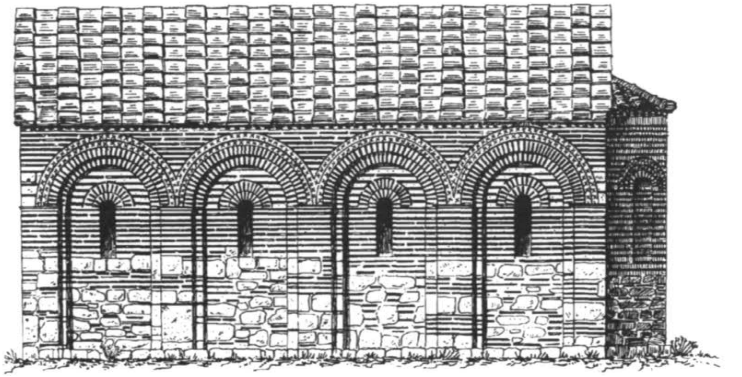
14. Church Ruin at Egri Dere, West Facade (about 1906)



15. The Church of the Virgin at Sikelia from the South West (about 1929)

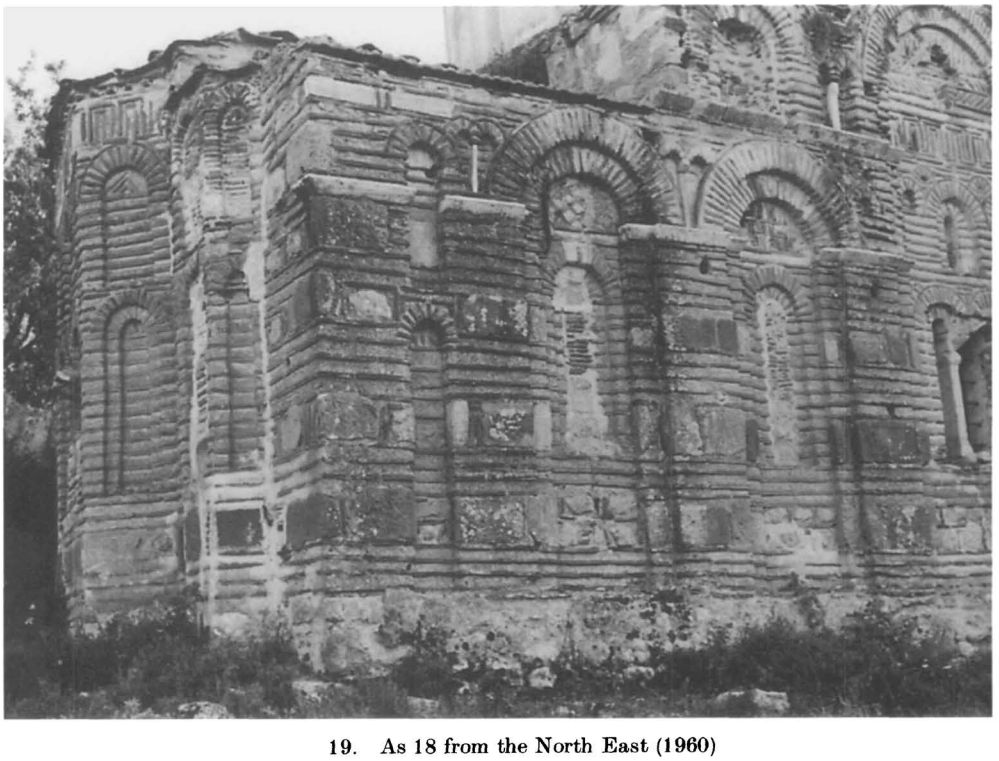


16. As 15, North Elevation (1929)

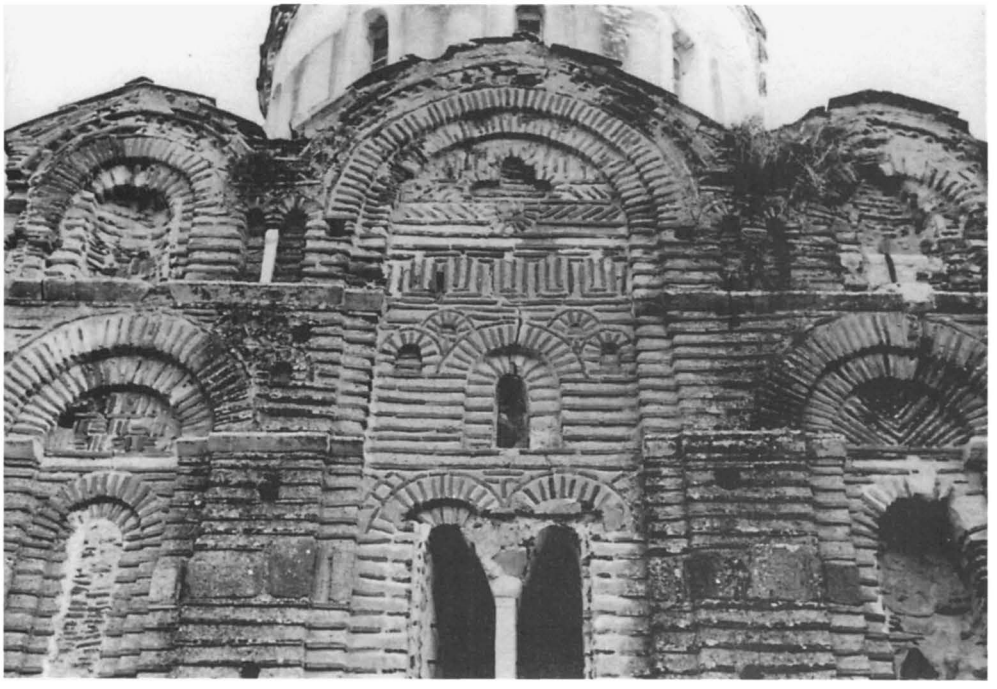


17. The Church of St. John at Chalkios, South Elevation (1929)

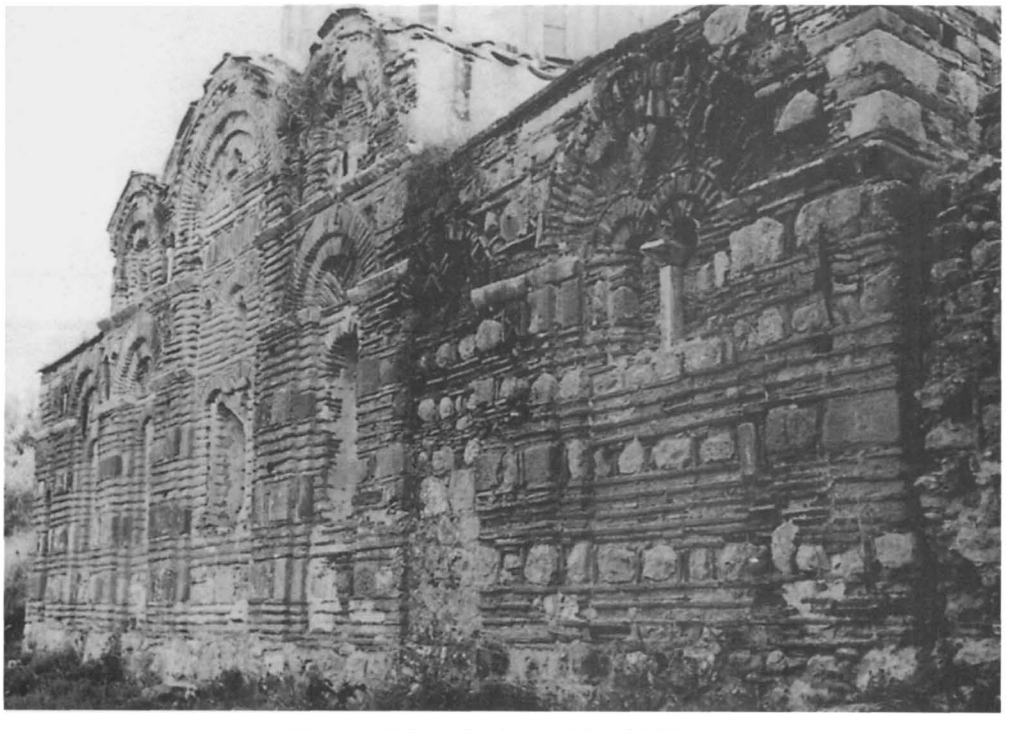
18. The Church of the Virgin at Krina from the East (1960)



19. As 18 from the North East (1960)



20. As 18, Central Portion of the North Facade (1960)



21. As 18 from the North West (1960)

22. The Palace of Nymphaeum, West Facade Detail (1972)

23. As 22, Facade Detail (1972)

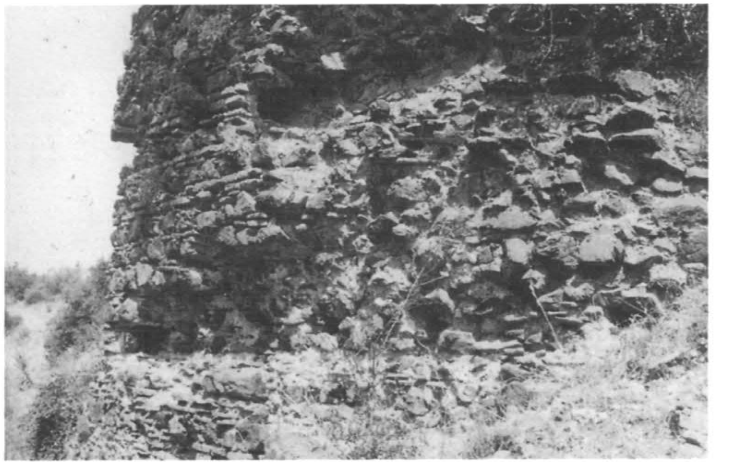
24. As 22, Interior Detail, N.W. Pilaster of Central Bay looking N. (1972)

25. Latmos Church 8, Narthex N.W. Corner (1972)

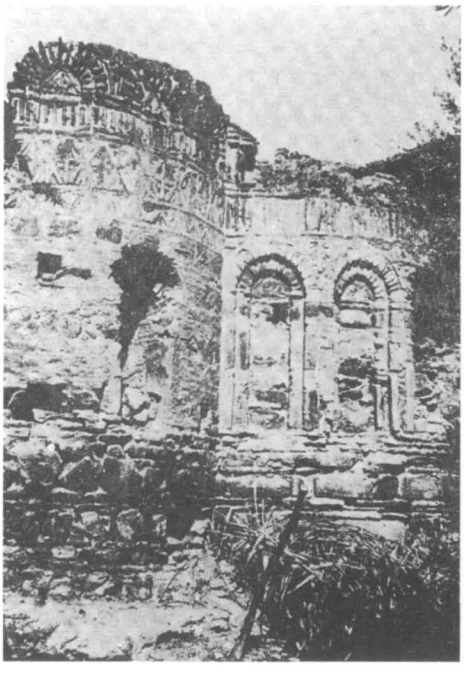
26. As 25, Western arcade of the North Facade (1972)

27. As 25, Eastern Arcade of the South Facade (1972)

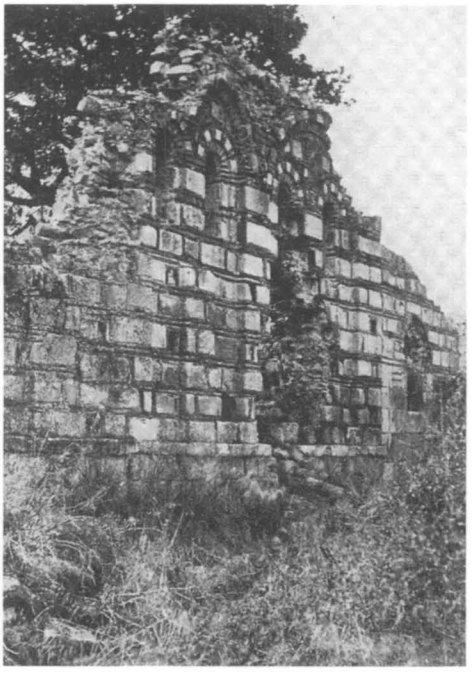
28. The Church of the Virgin at Krina, North Facade Detail (1960)



29. The Upper Citadel of Manisa, Interior Wall Detail (1975)

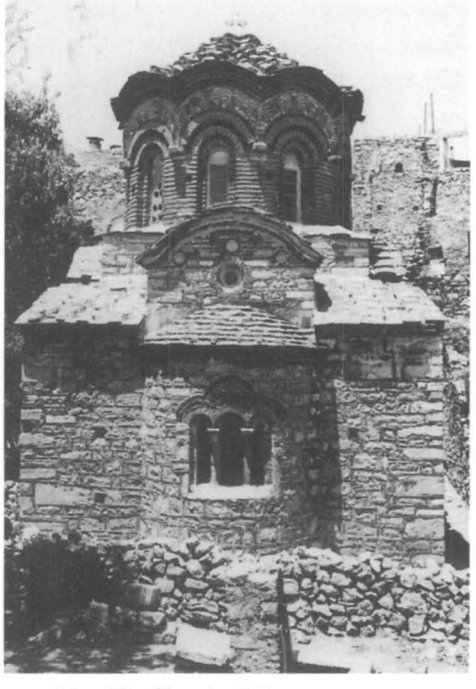


30. The Church of the Prophet Naum in Alaşehir, Apse (about 1905)



31. Latmos Church 4 (Ikis Ada) from the North East (about 1906)

32. The Church of St. John at Chalkios, Apse (about 1929)



33. The Church of the Holy Apostles at Pyrghi from the East (1960)

The flanking facades are articulated by blind arcades which reflect the organization of the nave and bema plan, and each of the three faces of the apse exterior is articulated by blind arcades in two stories. The apsidal niches which flank the apse on the interior are also reflected by blind arcades on the eastern facade, while on the western facade a blind arcade is used on either side of the doorway. The fenestration of the church consists of single and binate windows located in the north facade, three windows of equal height separated by pillars in the apse, and, apparently, eight windows in the dome. All of the arcades, including those of the dome, were recessed twice not only in the zone of the arches, but also in the pilaster zone, giving the church at Sikelia an unusually unified and harmonious appearance. The sense of unity is underscored by a frieze formed of hollow clay quatrefoils like those used in Krina and Sardis E, which surrounds all of the outer arches of the facade articulation. The limited number of motifs used to decorate the lunettes also contributes to the sense of harmony. They include herringbone brickwork, horizontal courses of quatrefoils which alternate with brick courses, crosses inscribed in circles made of hollow quatrefoils, and apparently also checkerboard brickwork. Neither the lunettes of the eastern nor those of the western facades seem to have contained ornamentation. Some of the spandrels were also decorated with horizontal courses of hollow quatrefoils.

The arches of the blind arcades and windows, and the masonry facing of the dome and of much of the wall area above the spring line of the major facade arches are constructed entirely of brick, while below the spring line of the facade arches the masonry facing consists of one or two courses of well cut ashlar which alternate with three, or, more often, four to five courses of brick. As at Krina and Nymphaeum the ratios between the heights of the ashlar courses and those of the brick bands tend to be close to 1 : 1, although they vary somewhat in some areas. The mortar joints are somewhat higher than the bricks, indicating that recessed brickwork or brick filled mortar joints may have been used, even though the mortar joints are not nearly as high as those of Krina. Neither vertically set bricks nor bricks which form characters of the Greek alphabet seem to have been used at Sikelia.

The Church of St. John the Baptist at Chalkios, Chios

Blind arcades recessed twice also articulate the facades of the small church of St. John the Baptist at Chalkios on Chios, a building with a single barrel vaulted nave (Fig. 9, 17, 32)[65]. The interior is articulated only by wall

[65] IDEM, Pl. 51—53; BOURAS 53. The lack of accuracy in published drawings can be demonstrated in ORLANDOS' plan Pl. 51. While the exterior and interior widths given in the written dimensions of the drawing agree completely with the scaled dimensions, the interior written length, 8.65 m does not agree with the scaled dimension, which is about 9.56 m. The

pilasters which continue as ribs without interruption in the vaulting zone, and by shallow blind arcades reminiscent of the more pronounced arcades at Sikelia. The fenestration consists of a single narrow window in each bay of the lateral facades and of a binate window in the center of the apse, which is circular in plan. Two exedral niches are located in the apse exterior. Two concentric friezes of hollow quatrefoils surround the outer arches of the blind arcades, the apse exedral niches, and the apse windows, reminding of the use of the same motif in Sikelia and in Sardis E. The only ornamental brick pattern used at Chalkios seems to have been the chevron in the east facade, north of the apse, the same location in which it was used, on the northern apse, at Sardis E.

The original masonry facing of most of the upper portions of the facades is of brickwork with mortar joints which are two to three times as high as the brick courses, probably indicating that it was constructed in the recessed brick technique used at Krina. Although the lower portion of the facade facing is of ashlar and brick not usually in regular horizontal courses, in some of the pilasters and near the top of the ashlar zone well cut, more regular courses of ashlar blocks which alternate with three to four courses of brick are used, reminding of the bands of alternating brick and ashlar at Krina and Sikelia. While these, and the other specific similarities to churches of our group relate the church of St. John at Chalkios to the same general period, the similarities are not as strong as those described in most of the other churches.

Other Churches on Chios

Several other churches on Chios also show some of the characteristics described above, but either the characteristics are not, by themselves, distinctive enough, or they are not accompanied by other important features, and these churches can therefore not be convincingly attributed to our group. The church of the Holy Apostles at Pyrghi, for instance, has facades articulated by blind arcades and by friezes of hollow quatrefoils, but lacks the ornamental patterns and the alternating bands of brick and ashlar typical of the other churches (Fig. 33)[66]. Although the facades of the church of St. George Sykousis are richly articulated by blind arcades recessed once, twice, or three times in a hierarchically ordered sequence particularly similar to that of Sardis E, its facades are covered by plaster, prohibiting a comparison of the

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over all exterior scaled dimensions of the church, excluding the apse, are close to those of a rectangle with its sides in the ratio of $1 : \sqrt{3}$, a rectangle which can be simply constructed with the use of a rope, and which can be directly derived from a rectangle with its sides proportioned $1 : \sqrt{2}$. The same construction seems to fit the plan of Latmos church 4.

[66] IDEM, 42ff., Fig. p. 39, with further references; ORLANDOS, Pl. 36–42.

masonry and possible brick ornamentation[67]. The same limitation prohibits an accurate assessment of the church of St. Galas[68]. The church of the Transfiguration at Managros and that of the Taxiarchs at Katarraktis both have facades articulated by blind arcades and ornamental brick patterns, and the latter church also has friezes of hollow quatrefoils[69]. But neither church seems to have been constructed with masonry characteristic of our group, and the small scale, as wwell as the monolithic supports of the blind arcades at Katarraktis are too different in character to be directly comparable with those of the other churches.

The Church of the Prophet Naum, Philadelphia

A photograph of part of the eastern facade and a brief description are all that is known of the church of the Prophet Naum in Alaşehir (Philadelphia), less than 50 km east of Sardis (Fig. 30)[70]. As in Sardis the major apse seems to have had five sides while the minor apses were built on a circular plan. Blind arcades recessed twice articulated the upper zone of the minor apse and, apparently, the upper and middle zones of the central apse. Each apse had a large window in the middle zone and the central apse also seems to have had a small window in the center of each arcade of the upper zone, a similar solution to that used in Latmos church 8. The arches are entirely of brick, apparently without smaller bricks and brick chips in the mortar joints. The lunettes are decorated with brick patterns including inverted "V"s like those of Krina. A frieze of high bricks set vertically, similar to the meander of Sardis E, but without open elements at the top and bottom was used between the upper and lower blind arcades of the major apse. At the same height the south apse is decorated by a rich ornamental brick frieze of crosses inscribed in lozenges which can also be read as a series of christograms. Between this frieze and the blind arcade there is a meander band constructed in the same manner, but slightly lower than the meander frieze of the central apse. Below the frieze of christograms there is still another ornamental brick friezee of alternating bricks set vertically and diagonally. The spandrels above the blind arcades were decorated by patterns which included vertically set bricks at the centers, reminding of similar, though somewhat simpler forms in the equivalent positions at Krina, Latmos church 8, and Eğri Dere.

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[67] IDEM, P. 49–50, 53; BOURAS 53f. with further references.

[68] IDEM 70 with further references; ORLANDOS, Pl. 53–55.

[69] IDEM, Pl. 55–56; BOURAS 28f., 46 with further references.

[70] G. LAMPAKIS, Χριστιανικὰ μνημεῖα, ἐρείπια καὶ συντρίμματα. Ἑπτὰ ἀστέρες τῆς Ἀποκαλύψεως. Athens 1906, 377ff., Fig. 181. A thorough search of Alaşehir in 1975 provided no clue concerning the church, which may have been completely destroyed since Lampakis' report was written.

Below the ornamental zones of the eastern facade at Alaşehir the facing is constructed of courses of ashlar which alternate with two to three courses of brick, vertically set bricks being used occasionally between the ashlar blocks. The ratios of the heights of the brick bands to those of the ashlar courses vary between about 1 : 1.5 and 1 : 2. The heights of the mortar joints of the brickwork seem to be about equal to or slightly less than those of the brick courses.

2. Dominant Characteristics

The analytic description of the palace at Nymphaeum and of the eight churches at Sardis, Alaşehir, in the Latmos area, and on Chios clearly demonstrate that these buildings are closely related by similarities, above all, in the articulation, decoration, and detailing of their facades and by the use of distinctive structural techniques. It is equally clear that the major architectural forms of the buildings, their plans, spacial solutions, and vaulting schemes, do *not* have equivalent similarities. Indeed, it is a dominant characteristic of our group of churches that the major architectural forms are *not* based upon a single church plan, that they do *not* follow a clear pattern of development, and that they do *not* have distinctive similarities. Of those churches with known plans and vaulting schemes only Sardis E has four minor domes on the diagonal axes of the major dome and six columns, only Latmos 8 is built upon the typical inscribed cross scheme with four major supports, only Krina imitates the domed single nave solution of Nea Moni, only Sikelia combines the inscribed cross scheme with the vaulted single nave basilica, and only Chalkios uses the vaulted single nave basilica solution without a dome.

Similarities which do exist among the major interior features of the churches are limited to more formal qualities. The most important is perhaps the use of simple geometric constructions which appear to underly a number of the plans (Figs. 3—9). The most complex is the *quadratura*, which seems to have determined the location of major features in Sardis E[71]. The plan of

[71] Buchwald, Sardis 271 f., Fig. 7, and Fn. 32, 60, 64, 65 above. The dimensions and geometric constructions were checked in the church itself only at Sardis, and the results summarized here, based upon the published plans, must also be checked in the churches before they are finally accepted. To me the most convincing arguments in favor of the use of the geometric constructions suggested here are that they seem to fit the published plans well, that they are quite simple to perform on the building site, and that they are, for the most part, all very similar, beginning with a basic square and its diagonal to obtain major dimensions. The relevance of geometric constructions, particularly the square and sphere, at the court of Theodore II Laskaris and possible symbolic considerations are discussed in H. Hunger, Von Wissenschaft und Kunst der frühen Palaiologenzeit. *JÖBG* 8 (1959) 123ff. and E. Ivánka, Mathematische Symbolik in den beiden Schriften des Kaisers Theodoros II. Laskaris Δήλωσις

Sikelia seems to have been determined by a rectangle with its sides proportioned $1 : 1 + \sqrt{2}$, that of Latmos 8 by a rectangle with its sides proportioned $1 : \sqrt{2}$, and that of Krina by a rectangle with its sides proportioned 1 : 2. A rectangle with its sides proportioned $1 : \sqrt{3}$ may have determined the exterior dimensions of Chalkios and Latmos 4. All of the constructions are simple to perform, requiring only a rope, but not the use of sophisticated formulas or mathematics, and all but Sardis were used primarily to determine over all exterior dimensions.

Other characteristic similarities in the spacial solutions of the better preserved churches are also worth noting. For instance, there is an emphasis on and extension of the major axis of the church, found in Sardis E, in Krina, Sikelia, and to a lesser degree in Chalkios, at Latmos 8, and perhaps at Latmos 4[72]. There is also a tendency to use simple, open, strongly unified spaces, achieved at Sardis E and Latmos 8 by the lack of walls between the bema and the flanking spaces, and at Krina, Sikelia, and Chalkios by the use of simple, single nave solutions. The flanking spaces which are completely or almost completely open to the bema, and the lack of ambulatories, parekklesia, or other isolated features contribute to the spacial unity of the solutions. In most cases only the narthex is experienced as a distinctly separate spacial unit. Although the narthex does not seem to have been built together with the naos at Krina, Latmos 8, and Latmos 4, it seems to have been part of the original conception, for the differences in articulation and detailing are relatively slight, indicating that the narthex was built almost immediately after the main part of the church. At Sikelia the narthex, which is subtly marked by the somewhat wider pilaster between the two western bays and the rest of the church, is fully integrated with the naos, adding considerably to the strong spacial unity and emphasis on the major axis.

On the whole the minor architectural features of the churches cannot be compared, partly because of the poor preservation of many of the buildings, and partly because of the great variations in their architectural schemes. For instance, portions of the drums of the domes are preserved in only three

φυσική und Περὶ φυσικῆς κοινωνίας. *Byz. Forschungen* 4 (1972) 138ff. P. UNDERWOOD, Some Principles of Measure in the Architecture of the Period of Justinian. *Cahiers Archéologiques* 3 (1948) 64ff. traces comparable constructions. The quadratura was used in tombs in Asia Minor attributed to the 4th century (M. MELLINK—A. M. MANSEL, Gemlik-Kios. *American Journal of Archeology* 71 (1967) 173, implying that it was used in Byzantine architecture with long standing local roots and, probably, with symbolic implications).

[72] BUCHWALD 266 for Sardis. The elongation is most pronounced at Sikelia, where it is achieved above all by uniting the naos and the narthex; at Krina it is achieved by opening the bema arches directly to the space underneath the major dome and by lengthening the bema (compare ORLANDOS, Pl. 10—11 with Pl. 32—33). In Latmos 8 the east-west elongation is somewhat less pronounced, but exists in the dimensions of the major naos barrel vaults.

examples, Sardis, Krina, and Sikelia. However, while at Sardis the domes are very small, windowless, and located over the corner bays of the naos, at Krina and Sikelia they have 12, 8, and 6 windows or window arches respectively, and are located over the central portion of the naos or the narthex[73]. The only minor architectural feature which is comparable in many of the churches is the exterior form of the apse. In Sikelia and Chalkios, the two smallest churches, only the major apse projects. It is built on a three sided plan in Sikelia, but is circular at Chalkios. Only at Krina each of the three projecting apses have three sides. Both Sardis and Alaşehir have central apses with five sides and flanking apses on a circular plan. Latmos church 8, which has exactly the same width as Alaşehir, has the most elaborate apsidal solution, for its major apse has seven sides while each flanking apse has three.

Although facades articulated by blind arcades are a characteristic feature of all the churches, there are significant differences in their locations, in their relationship to interior features, and in their details. The most uniform articulation is found in the facades of Sikelia and Chalkios, which have only blind arcades recessed twice not only above, but also below the spring lines of their arches. In the Latmos churches the arcades are recessed twice above the spring lines, but only once in the pilaster zone, an abbreviated solution lacking the harmony and unity of Sikelia and Chalkios. In Latmos church 4 there are also secondary pilasters without a direct relationship to the arcades, still further disrupting the unity of the articulation. Blind arcades which are recessed either once, twice, or three times are used only in Sardis and in Krina. However, in Sardis the differently recessed arcades are used in a rhythmic alternation and they reflect the interior organization of the church, as they do in all of the other churches of our group, while at Krina there is a rhythmic alternation of differently recessed arcades only in the eastern facade, and a number of the arcades have no relationship to interior features. The similarity of the frieze-like application of blind arcades in the

[73] IDEM 266, 298 for the Sardis domes and their cylindrical drums; the drums of the major dome at Krina, and of both domes of the church of the Holy Apostles at Pyrghi are also cylindrical. The drum of the dome at Sikelia is cylindrical in the pier areas between the windows, but the window arcades appear to be almost straight in plan, giving the drum an ambiguous form which is neither quite cylindrical nor quite octagonal. The solution at Sikelia clearly illustrates the structural advantage of constructing a drum with windows on a polygonal plan (cf. IDEM, Fn. 136). The narthex dome at Krina is a modern reconstruction which may retain the original forms. BOURAS 30 considers the original drum of the major dome to be dodecagonal, with pairs of pilasters at the angles, but enough of the original masonry of the drum is extant to be certain that its form was essentially cylindrical, even though here, too, the twelve windows themselves may have been straight in plan. The existence of cylindrical drums in the cited examples may mean that the cylindrical forms at Sardis need not be derived from Greek examples, but depend upon a local tradition (cf. BUCHWALD 298).

apse solutions of Sardis, Latmos 8, and Alaşehir is particularly striking, even though they are applied to the flanking apses only at Latmos 8 and Alaşehir, and not at Sardis[74]. The two story, more strongly differentiated application of blind arcades to the eastern facade of Krina is closer to that of Sikelia. Only at Chalkios is the blind arcade articulation replaced by exedral niches in the apse. The typical blind arcade facade articulation is missing in the narthex of Latmos 8, in the narthex of Latmos 4, and in the palace at Nymphaeum.

The extremely rich ornamentation of the facades is even more distinctive in our group of buildings. Perhaps the most common motif is the meander, which appears in its standard form with two strains only at Krina and in its unusual double form, one meander above the other, only at Sardis and Latmos 8. While the meander at Sardis, both in its single and double form always maintains a continuous flow and steady rhythm, the meander at Latmos 8 is broken into individual units with more complex rhythms, and that at Alaşehir is abbreviated as an intensively rhythmic band, a motif which also occurs in a very short section of the south facade at Krina. The chevron is also a recurring motif, and is used at Sardis, Krina, Latmos 8, and Chalkios. Herringbone brickwork and related motifs are found at Sardis, Alaşehir, Krina, and more extensively at Sikelia. Checkerboard brickwork is used extensively at Sardis and seems also to occur at Sikelia. While patterns of lozenges or scales occur at Krina and at Latmos 8, the basketwork pattern seems to be unique to Krina and the complex frieze of crosses and christogramms to Alaşehir. Recessed roundels are used in all three Latmos churches, and similar motifs also occur at Krina and Sikelia. Small "T" formations and similar forms are used in the spandrels at Krina, Alaşehir, and in the three Latmos churches. Single friezes of hollow quatrefoils are used extensively to underscore important features at Sikelia and Sardis, and two parallel or concentric friezes are used in similar locations at Sardis, Chalkios, and occasionally at Krina; in Sikelia series of parallel quatrefoil friezes are also used to fill the surfaces of lunettes and spandrels. Stone voussoires which alternate with brick are used primarily in the arches of the blind arcades in Latmos 8, but are used consistently in the arches of the blind arcades and windows in Latmos 4. Finally, bricks placed together to produce forms similar to the characters of the Greek alphabet occur in the vertical joints of the ashlar courses at Nymphaeum, Krina, and the narthex of Latmos 8[75].

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[74] BUCHWALD, Sardis 267f., Fig. 2, 3, 4, 16 for the Sardis solution.

[75] The poor state of preservation and the lack of knowledge concerning some of the churches must be considered when evaluating these comparisons. Bricks set together to form characters of the Greek alphabet may, for instance, have occured in lost portions of the masonry at Sardis, Alaşehir, and in the Latmos churches, and stone voussoires may have occured in the flanking facades at Alaşehir.

The richest use of brick facade ornamentation occurs at Krina, where almost every lunette and many spandrels are each decorated by a different pattern and the central lunettes are decorated by several friezes and patterns one above the other. While the number of patterns used at Latmos 8 is somewhat less and several lunettes of its facades are not decorated, the meander, chevron, and lozenge patterns are located in almost exactly equivalent positions there, suggesting a particularly close relationship between the two churches. A comparable richness is also achieved in the series of decorative brick friezes on the southern apse of Alaşehir. The decorative brickwork at Sardis, on the other hand, is used with far greater regularity and orderliness than at Krina, even though a relatively large number of motifs is applied to different parts of the facades; each of the four extant lunettes, for instance, is decorated by a checkerboard brick pattern. Similar regularity and orderliness is also achieved at Sikelia, where three lunettes of the same facade are decorated with herringbone brickwork and the lunettes of the eastern facade remain undecorated. At Chalkios none of the lunettes or spandrels seems to have been decorated with ornamental brickwork. Ornamental brickwork also does not seem to occur in the facades of the palace of Nymphaeum, except for the engaged column of cut brick on the west facade and the occasional bricks in the ashlar joints which were set to form characters similar to those of the Greek alphabet.

Facade facing constructed of one or two courses of ashlar which alternate with several courses of brick is also a dominant characteristic of most of our group of buildings. Its is most prominent at Nymphaeum, where the striped effect completely dominates the design of all four facades. At Krina and Sikelia the alternation of ashlar and brick in an almost constant ratio of 1 : 1 is similar to Nymphaeum, although the striped effect is not as strong and not as important in the total design of the facades. In the other churches the use of ashlar courses which alternate with brick is still apparent, but there are usually fewer brick courses in each layer of brick, the courses are not as regular, and the strong horizontal effect of the ashlar courses is reduced by occasional vertical, and sometimes also horizontal bricks in the vertical ashlar joints. In these churches the regular horizontal stratification is often concentrated in specific areas, for instance in the eastern and the eastern part of the southern facades of Latmos 8 and near the pilasters of Chalkios. Only rarely, for instance in Eğri Dere and Latmos 4, do the vertically placed bricks in the ashlar courses become so common in some areas that the visual effect becomes similar to that of cloisonné masonry.

Recessed brickwork is used in the churches at Krina and apparently also at Sikelia and Chalkios, and the closely related technique with thin bricks and brick chips in the mortar joints is used in Latmos church 8 and the facade

fragment at Eğri Dere. Thin mortar joints with heights nearly equal to those of the brick courses are common to Nymphaeum, Sardis, Alaşehir, and Latmos church 4, and the brick filled mortar joints of Latmos 8 and Eğri Dere are hardly higher. Unfortunately the available evidence concerning the masonry facing used at Sardis church E and Alaşehir is minimal.

A system of horizontal timber reenforcement inside the masonry, usually at the levels of the floor, the spring lines of the major arches, and immediately above the vaults is common to all of the buildings for which the relevant information is available, including Nymphaeum, Sardis, Latmos 4 and Latmos 8. A similar system of timber reenforcement was used in the walls of the upper citadel at Manisa, which was probably constructed during the Lascarid period (Fig. 29)[76].

3. Stylistic Currents

Without definitive dating evidence it is difficult to determine a broad stylistic evolution within our group of buildings. The possibility that some characteristics are due not to a general stylistic evolution, but rather to local currents or lingering traditions which exist within, and perhaps contrary to a more general stylistic context still further complicates the picture and adds to the uncertainty. The possibility that those responsible for each building, the architects and his clients in modern terminology, may have had somewhat different means available or different individual aims or wishes should also be taken into account.

Nevertheless, a comparison of numerous specific features can be used to determine some stylistic currents within our group of buildings, and in some cases also a relative chronology.

The common characteristics which typify the three Latmos churches within our larger group are, for instance, immediately apparent. They include the use of blind arcades which are recessed twice above, but only once below the spring lines of the arches, the frequent use of ornamental recessed brick roundels, and the relatively strong reliance upon the cloisonné masonry tradition. Stone voussoires which alternate with brick, a decorative feature which seems to occur relatively late in a given city or province in Byzantine

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[76] C. Foss, Late Byzantine Fortifications of Lydia, below, 306ff., with further references for the date; also A. Heisenberg, Kaiser Johannes 171f.; Buchwald 287, Fig. 21; Fn. 83 below: Müller-Wiener, Stadtbefestigungen 72, 82 for the same type of timber reenforcement in portions of the Izmir citadel walls which are securely attributed to John II Laskaris. Similar techniques were used as early as the archaic and pre-Hellenic periods in Asia Minor (for instance K. Kjeldsen—J. Zahle, Lykische Gräber. *Archäologischer Anzeiger* 90 (1975) 312ff.).

architecture[77], do not seem to occur at Eğri Dere and are used much more extensively in Latmos 4 than in Latmos 8, suggesting that Eğri Dere is the earliest and Latmos 4 the latest of the Latmos group. The same chronological sequence is also indicated by the use of bricks and brick chips in the horizontal mortar joints of Eğri Dere and Latmos 8, but not of Latmos 4, for this practice is derivable from the recessed brick technique typical in Constantinople in the 11th and 12th centuries, but not thereafter. The intermediate pilasters of the Latmos 4 facades and the lack of coherence which they create seem therefore to represent a late development, which can be traced nowhere else in our group of buildings, and which seems to replace the clear blind arcade articulation found at Eğri Dere and Latmos 8. The cloisonné character of the Eğri Dere facade masonry, on the other hand, seems to be an earlier Latmos feature, and the stratified masonry with the distinctive "striped" effect seems to have been introduced to the Latmos area only after the church was built. The strong regularity of the horizontal brick layers in Latmos 4 may well represent an amalgamation of the stratified masonry tradition, perhaps introduced to the area with the construction of Latmos 8, and an older local cloisonné masonry tradition.

The church at Krina can be related to the Latmos sequence, for the close similarity in the use of specific motifs at Krina and Latmos church 8 can hardly be coincidental. The use of the chevron immediately above the meander in the major lunettes of the flanking facades in both churches is particularly striking, and the lozenge pattern in the flanking lunette of Latmos 8 is also found in a comparable location at Krina. The greater precision with which the ornamentation is executed, and the larger repertoire of motifs used at Krina makes it more likely that the Krina facades served as models for those of Latmos 8 than *vice versa*.

This conclusion is also confirmed by a comparison of the meander bands which occur on the apse facades of Krina and Latmos 8, for the double meander of Latmos 8 is much richer than the single meander used in the same position at Krina. While the Krina meander still has the classical features of the meander bands found frequently in similar positions in 12th century churches, the meander of Latmos 8 seems to represent a direct and somewhat more complex development of the similar but still more classical double meander used on one of the domes of Sardis church E. The loss of the classical form and of the regular rhythm of the meander frieze, which can be traced from Krina to Sardis, and from Sardis to Latmos 8 seems to have reached its

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[77] Stone voussoires which alternate with brick do not yet appear in the Fenari Isa Camii south church, for instance, but are found frequently, if by no means universally, in later Paleologue buildings in Istanbul.

final stage, within the churches of our group, on the apse of the church at Alaşehir. Here the disintegration of the original motif, which can already be observed at Sardis and Latmos 8 has continued until the meander can hardly be recognized. While the meander at Latmos 8 can still be read as a variation on the original theme, the meander at Alaşehir is legible only as a simile for the original motif. The development in the details of the meander bands therefore implies a chronological sequence with Krina at the beginning, Alaşehir at the end, and Sardis E and Latmos 8 in that order in the middle.

Other chracteristics of the apsidal solutions used in these churches fit into the same general pattern of development. The use of a frieze-like series of uniform blind arcades on the apsidal facades, for instance, is common to Sardis, Latmos 8, and Alaşehir, in contrast to the less uniform arcaded articulation of the Krina east facade. The arcaded articulation is still more unified and more consistent than at Sardis in the solutions at Latmos 8 and Alaşehir, where the arcades are used not only on the major apse but also on the flanking apses. This apparent tendency toward uniformity and consistency in the use of blind arcades on the apsidal facades seems to reach its final culmination at Alaşehir, where the blind arcade motif used to frame the lower windows of the major apse is also extended to each unfenestrated facet of the major apse, in contrast to the more limited use of the same motif in Latmos 8. The chronological sequence implied by the development toward greater uniformity and consistency in the use of blind arcades on the apse facades is therefore the same as that suggested by the development of the meander frieze: Sardis E, Latmos 8, and Alaşehir. The similarities in the articulation of the apse facades in these three churches are particularly striking.

Although friezes of hollow clay quatrefoils may have been used occasionally to decorate facades before the 13th century[78], they were used with much greater frequency in the latter part of the 13th and in the 14th centuries. Also, they were used in tombs with ogival arches which probably date to the late 13th century in the narthex of the church at Krina[79]. It therefore seems reasonable to attribute the church at Krina, in which this decorative motif was used quite sparingly to an earlier date than the churches at Sikelia and Chalkios, in which quatrefoil friezes are used extensively. The

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[78] A. H. S. MEGAW, Byzantine Reticulate Revetments, in: Χαριστήριον εἰς Α. Κ. Ὀρλάνδον, III. Athens 1966, 12, with references and a list of early examples. Also S. EYICE, Quatre édifices inédits ou mal connus. *Cahiers Archéologiques* 10 (1959) 252ff. for a tomb (?) at Tokat with closely related quatrefoil friezes and further references.

[79] BOURAS, Chios 30ff., with further references; ORLANDOS, Monuments, Pl. 33. The tombs partially block the windows of the narthex and must have been built later than the church.

extensive use of the same motif in the facades of Sardis E supports these attributions because, as we have already seen, the development of other motifs also suggests that Sardis E was built later than the church at Krina. While the lack of the quatrefoil frieze in many of our churches, for instance those in the Latmos area and at Alaşehir, may, perhaps, be partially due to their poor preservation, it can also be explained by assuming that the motif was primarily used locally on Chios, within our group of buildings, and was only occasionally adapted elsewhere, as in Sardis. Because of the arguments presented above this explanation seems more reasonable than to assume that the churches in the Latmos area and at Alaşehir were built before the church at Krina.

The very rich use of the quatrefoil frieze in the decorative articulation of the facades is not the only characteristic which Sardis E and the church at Sikelia have in common. In both churches the inscribed cross scheme is fused with a basilical solution, even though the church at Sikelia, which is much smaller, has only a single nave. Also, the number of motifs used in a single context, for instance in the lunettes of the blind arcades, are relatively few in both churches when compared, for instance, with the profusion of motifs used in the lunettes at Krina. The tendency toward stronger uniformity and consistency which we have traced in the apse solutions can therefore also, apparently, be traced at Sardis and Sikelia in the brick ornamentation of the facades. The three sided apse at Sikelia, articulated by blind arcades which differ in size and which are organized in two full stories does not, however, fit into the apse development of Sardis, Latmos 8 and Alaşehir; rather, it seems to depend directly on the apsidal solution of the church at Krina.

The lack of extensive brick ornamentation at Chalkios may, perhaps, be explained by assuming that it was built for humbler patrons, for it is a good bit smaller in size and simpler in form than the other churches of our group[80]. Although the circular plan of the apse exterior and the exedral niches in the apse facade could be interpreted as early features, distantly related, perhaps, to 11th century examples, other characteristics of the church indicate that it may have been built late within the period of our group of buildings. The church is similar, in several respects, to the church of the Holy Apostles at Pyrghi on Chios, which has been attributed to the late 13th or 14th centuries, a larger and more complex building with architectural forms based on those of Nea Moni (Fig. 33). Like Chalkios the church at Pyrghi has a cylindrical apse without blind arcade articulation, has facades articulated by blind arcades which are recessed twice, lacks extensive brick ornamentation, and is richly

[80] The interior and exterior articulation of the nave at Chalkios could also be interpreted as a simplification of the Sikelia solution.

decorated with series of quatrefoil friezes[81]. If the late attribution of the church at Pyrghi is correct, then the church at Chalkios may, perhaps, represent a late stylistic development, within our group of buildings, which is typical of Chios but is not found on the mainland. The church at Alaşehir, for instance, which also seems to have been built late within our group of buildings, had particularly rich brick ornamentation and does not seem to have been decorated with quatrefoil friezes.

Although the facades of the palace at Nymphaeum seem to have lacked blind arcade articulation and brick ornamentation, they can be related to the stylistic currents observed above with the aid of an analysis of their stratified masonry facade facing. The stratified masonry used at Nymphaeum, Krina, and Sikelia is strikingly similar not only in its general effect, but also in its regularity, scale, and in the relative heights of the individual bands of brick and ashlar. The use of similar masonry probably at Sardis E, and to a lesser degree at Latmos 8 and Chalkios is also apparent. However, while at Nymphaeum the powerful visual effect of the stratified masonry is the most important decorative feature of all four facades, in the churches the decorative effect of the stratified masonry is not fully exploited, for it is secondary to the blind arcade articulation and to the brick ornamentation. The difference is underscored by the observation that the very thin horizontal mortar joints used at Nymphaeum helped to achieve the dense coloring of the brick bands, so effective in obtaining the bold contrast between the brick and ashlar strata. The high mortar joints of the recessed brickwork used at Krina, on the other hand, tend to lighten the color of the brick bands and to dissolve their density, making them less important in the total composition of the facades and less effective.

I believe that the best explanation for these observations is provided by assuming that the palace at Nymphaeum was built before the church at Krina. The brilliant architectural effect achieved in the palace facades with the use of stratified masonry facing was then imitated at Krina and subsequently at Sikelia, Chalkios, Latmos 8, and probably in the other later churches, but in a less explicit version, watered down and mixed with various other currents and traditions. The diminishing use of stratified masonry in

[81] ORLANDOS, Pl. 36—42; BOURAS 42ff. believes that the church was constructed in the 13th or 14th centuries. For reasons presented on p. 278 above I do not believe that it was built during the Lascarid period. While it is possible to date the building to the 12th century because of its cylindrical apse, cylindrical drums and cloisonné masonry, the very extensive use of the quatrefoil frieze makes this interpretation seem unlikely in spite of the early examples cited by MEGAW (Fn. 78 above), in which the quatrefoil friezes are not extensive and not firmly dated. The extensive use of recessed brickwork at Chalkios, but probably not at Pyrghi also indicates that the churches are probably not contemporary.

the churches we have attributed to a somewhat later date, for instance Chalkios, Latmos 8, and Latmos 4 indicates that the initial impact of the Nymphaeum fassades eventually diminished and finally faded out, at least in the provincial examples now known in the area under consideration[82]. The lack of ornamental brickwork and quatrefoil friezes at Nymphaeum probably indicates that these decorative features were introduced into the architectural style of the area only after the palace was constructed. The continued use of recessed brickwork in the churches on Chios after the introduction of thin mortar joints at Nymphaeum, on the other hand, should probably be explained as a tradition imported from Constantinople or the surrounding area either in the 12th or more probably, as late as the 13th century[83].

The stylistic currents traced above can briefly be summarized as follows: 1) stratified masonry facing was used in the palace at Nymphaeum as the dominant, and perhaps the only decorative feature of its facades; 2) the stratified masonry of Nymphaeum seems to have been imitated in the facades of Krina, but it was used here together with profusely rich blind arcade articulation and brick ornamentation; 3) a quieter, more harmonious, more selective style, with greater regularity in the use of blind arcades and greater consistency in the choice of ornamental motifs seems to be evident in the churches at Sikelia and Sardis; 4) this tendency toward a quieter, more harmonious, more consistent style may have been responsible, in a still stronger form, for the church at Chalkios; 5) a number of characteristics found at Krina and Sardis seem to have been imitated, and also developed in the direction of greater richness and less dependence upon classical prototypes at Latmos church 8; 6) while local Latmos traditions may, for the most part, be responsible for the forms of the church fragment at Eğri Dere, probably built slightly earlier than Latmos 8, Latmos church 4 seems to represent an amalgamation of the earlier Latmos tradition with the new forms introduced in Latmos 8; 7) characteristics found at Sardis and Latmos church 8 are found

[82] Stratified masonry of alternating bands of brick and ashlar is a typical decorative feature of early Paleologue facades in Constantinople, for instance in the Fenari Isa Camii south church apse, the Kariye Camii parecclesion, the Fethiye Camii parecclesion, and the Tekfur Sarayi. While none of these examples is similar in detail to Nymphaeum, Krina, or Sikelia, the horizontality of the brick and ashlar bands in the Fenari Isa south church is comparable with that of Latmos church 4, one of the latest buildings in our series.

[83] Cf. fn. 46 above for dated examples of recessed brickwork; the technique could have been introduced to the Chios and Latmos areas by workcrews arriving from the Constantinople—Marmara—Nicaea region after 1204, for earlier examples are unknown at present in the region being considered here; local masonry is reviewed in W. MÜLLER-WIENER, Mittelalterliche Befestigungen im südlichen Ionien. *Istanbuler Mitteilungen* 11 (1960) 71ff.; IDEM, Die Stadtbefestigungen von Izmir, Sigacik und Çandarli. *Istanbuler Mitteilungen* 12 (1962) particularly 71ff., 81ff. and *passim*; also Foss, Late Byzantine Fortifications, 316ff.

also in the apse of the church at Alaşehir, developed in the direction of still greater independence from the original classical prototypes, and in the direction of greater richness and stronger unity.

The palace at Nymphaeum, church E at Sardis, and the church of the Prophet Naum at Alaşehir seem to represent a style close to the imperial court not only because of their central location in the area of imperial Lascarid power, but also because of the unusually high quality evident in each of these buildings. The exuberant richness, monumentality, inventiveness, and high quality evident in the church of the Virgin at Krina makes it tempting to attribute this building, too, to a workshop close to the Lascarid court. Possibly the church was an imperial donation commemorating Vatatzes' victory over the Latins on Chios. While the forms of the church of the Virgin at Sikelia are still close to those of the mainland, a quieter, more harmonious, simpler style perhaps typical of a late development on Chios may be evident in the church of St. John the Baptist at Chalkios. On the other hand, a local, somewhat provincial, perhaps monastic style with a tendency toward incoherent complexity seems to be traceable in the later churches of the Latmos area.

4. Chronology

Even though it is impossible, at present, to date any of the buildings of our group accurately because of the lack of direct evidence, the relative chronology provided by the stylistic analyses can be used, together with evidence concerning the history of the area, to establish a chronological framework to which the buildings can be related.

The region in which the buildings of our group are located is relatively small, occupying a triangle which measures about 125 km (Alaşehir-Latmos) × 170 km (Latmos-Chios) × 220 km (Chios-Alaşehir), an area somewhat smaller than the Peloponnesus. Its 13th century history is dominated above all by the struggle for power between the Byzantine Greeks, the Latins, and the Seljuk Turks. Most of the area was solidly in the hands of the Lascarid emperors, and enjoyed the flourishing prosperity of their brief reign, after the first years of consolidation following the Latin conquests of 1204[84]. The island of Chios, on the other hand, was taken from its Latin invaders by John Vatatzes only in 1225[85].

Already during the first years of Paleologue rule imperial interest shifted drastically from Asia Minor to Constantinople and the European provinces in

[84] Ostrogorsky, Geschichte 349ff. with the relevant sources; Vasiliev, History 507ff.; Gardner, The Lascarids *passim*.

[85] P. Wirth, Die mittelalterliche Inselwelt im Lichte der byzantinischen Kaiserdiplome. *Byz. Forschungen* 5 (1977) 421f. with the sources.

spite of increasing Turkish pressure after the middle of the century. Chios became a Genoese base of operations by the treaty of Nymphaeum in 1259, and was finally turned over to the Genoese in 1307[86]. The countryside between the Lydian cities is reported to have been ravaged by the invading Turks during the reign of Michael Paleologus, 1259—1282[87]. The situation was most critical in the south, where the Emirs of Menteşe, firmly established in Caria, repeatedly ravaged the undefended countryside of the Latmos area in the 1260's and 1270's, and were in control of the near-by cities by about 1280[88]. The coastlands and particularly the islands were under constant threat by Turkish pirates by the 1270's, a danger which increased considerably, and seems to have been augmented by Greek pirates after the dismantling of the Byzantine fleet in 1282[89]. Sardis did not finally fall to the Turkish forces until an unknown date not long after 1300, but historical, archeological, and numismatic evidence indicates that activity there was minimal after about 1260[90]. Although Nymphaeum continued to be visited by Byzantine emperors at least until the last quarter of the 13th century and Alaşehir remained in Byzantine hands until 1390, the atmosphere cannot have been conducive to the development of new architectural forms anywhere in the area after about 1260. The construction of new churches seems unlikely in the Latmos area after about 1265 and in most other parts of the former Lascarid possessions after about 1280[91].

The interface between the 13th century history of the area and the stylistic comparisons presented above suggests the following tentative and approximate construction dates for the buildings:
about 1210 — about 1230 (perhaps immediately after 1222) — the palace at Nymphaeum;
1225 — about 1240 (perhaps immediately after 1225) — the church of the Virgin at Krina;

[86] IDEM; a brief history of Chios is also given in BOURAS, Chios 10f. with further references; the encreasing pressure of Turkish forces after the middle of the century and the catastrophic effect of the neglect of the Anatolian frontier at the beginning of the Paleologue reign are emphasized particularly in P. WITTEK, Das Fürstentum Mentesche — Studien zur Geschichte Kleinasiens im 13.—15. Jahrhundert. *Istanbuler Mitteilungen* 2. Istanbul 1934, 15ff. and *passim*; also FOSS, Byzantine and Turkish Sardis 77ff., both with further references and the relevant sources.

[87] IDEM 79.

[88] WITTEK, ibid., particularly 24ff., 41ff.; WIEGAND, Latmos 4. — Die letzten Schicksale der Latmosklöster 185ff. with further references and additional sources.

[89] WITTEK 45ff.

[90] FOSS, Byz. and Turkish Sardis, particularly 81ff.; BUCHWALD, Sardis 295ff.

[91] FOSS, ibid. 78ff.; IDEM, Late byzantine Fortifications 318ff.; WITTEK 16f., *passim*; KIROVA, Un Palazzo 278, 294f. with further references for Nymphaeum; also HEISENBERG, Kaiser Johannes 171ff.

about 1230 — about 1245 — the church at Eğri Dere, the church of the Virgin at Sikelia, church E at Sardis;
about 1240 — about 1255 — Latmos church 8;
about 1240 — about 1265 — the church of St. John the Baptist at Chalkios;
about 1250 — about 1265 — Latmos church 4, the church of the Prophet Naum at Alaşehir.

These attributions assume that the masonry used at Eğri Dere already depends upon the recessed brickwork used at Krina even though other Krina characteristics do not yet appear there, and that the churches at Chalkios, Latmos 4, and Alaşehir were constructed, if not necessarily under Lascarid rule, at least still under the full influence of the Lascarid architectural development.

5. Origins and Influences

Although a detailed examination of the origins of Lascarid architecture, and of its influence on other styles is beyond the aims of the present investigation, I would like to make the following tentative observations and suggestions.

1. The lack of coherent direction in the choice of church plans and of spacial solutions seems to be one of the dominant characteristics of the buildings we have attributed to the Lascarid period[92]. Although some of the differences among the spacial solutions should probably be explained by differences in local tradition, in size, purpose, and patronage, the differences are strikingly atypical for middle Byzantine architecture created in a single area within a relatively short period. In the roughly equivalent groups of churches, for instance, in 12th century southern Greece, or in 12th century Constantinople a relatively limited number of solutions are used repeatedly, for the most part, with a limited number of variations. The dissimilarities among the spacial solutions in the Lascarid churches are all the more striking because of the very great similarities in facade details.

I believe that these observations can best be explained by assuming that Lascarid architecture was essentialy *eclectic* in its origins, borrowing its forms from a number of different sources, and coating them with a decorative covering or mantle to produce the *appearance* of a unified, easily identified, and lavish style. This hypothesis also explains the apparent lack of strong and direct ties between Lascarid and late 12th century Constantinopolitan architecture.

The eclectic disparity of spacial solutions on the one hand, and the unified, easily identified, lavish exterior coating on the other seems to me to

[92] P. 280f. above.

be the natural characteristic of an architectural style created, to a greater extent than any middle Byzantine style before it *de novo*, by a highly self-conscious, sophisticated, ambitious, but only partially established dynasty which needed new buildings as symbols for its military and political accomplishments, quickly, in an area which had little or no imperial architectural building tradition, an area which had been in an impoverished state of provincialism for centuries, and which had its strong cultural roots broken by repeated invaders the last of whom had been driven out only about a century before the arrival of the Lascarids.

2. Although eclectic borrowings, either from earlier Byzantine or other repertoires, are not unusual in pre-Lascarid Byzantine architectural history, Lascarid eclecticism seems to me to be unusual and distinctive. Previous borrowings seem only to have grafted details, decorative features, or other forms onto a strong Byzantine architectural development with recognizable continuity in basic forms which are rooted in the immediate past. The eclecticism was therefore a *secondary* characteristic, subordinate to other, stronger, and more continuous architectural currents. In Lascarid architecture, on the other hand, the eclecticism seems to be an essential and *dominant* characteristic, which was used to obtain the major architectural forms, and probably also most of the decorative forms as well. Also in contrast to earlier Byzantine periods, which borrowed from Persian and Arabic as well as Byzantine and classical sources, Lascarid borrowings seem to concentrate, for the most part, on the forms of the Byzantine and Hellenic past in an understandable attitude of fierce chauvinism. The Kufic brick forms which decorate 11th and 12th century facades in Greece, for instance, are transformed in Lascarid architecture to characters of the Greek alphabet.

3. Church E at Sardis seems to be unique among the churches we have attributed to the Lascarid period in that it may have been designed specifically to meet Lascarid functional and iconographic needs. I have pointed out elsewhere that church E has close affinities with the church of the Virgin Hodegetria in the Brontochion Monastery (Afentico) in Mistra, built in the first decade of the 14th century[93]. The similarities include most features of the plan and vaulting, and probably also the use of the *quadratura* to determine size and location of major features.

It has been suggested that the galleries of the Afentico owe their origin to the court ceremonial of the Despots of Mistra[94]. The architectural solution of the Afentico seems, therefore, to have been designed specifically for the use of the court, suggesting that the new design was necessary because no

[93] BUCHWALD, Sardis 281 ff.

[94] IDEM 283, Fn. 56 with further references.

suitable churches existed for the purpose in the city, where there had been no court previously. This same precondition for the design of the Afentico existed not only in Mistra in the early 14th century, however, but also in the centers of Lascarid power in western Asia Minor, for instance Magnesia ad Sipylum or Philadelphia, almost a century earlier.

It is impossible, today, to know whether church E at Sardis had galleries, and there is no known reason to believe that court ceremonial was important in church E[95]. Whether or not church E was built with galleries, I suggest, as a working hypothesis, that the church was built in imitation of a more important Lascarid building which did have galleries, and which was designed to meet the demands of the imperial Lascarid court in one of the political and cultural centers of the area, perhaps Magnesia, Philadelphia, Sosandra, or elsewhere in Asia Minor.

The underlying plan of Sardis church E, however, is not an invention of Lascarid architects. Two churches in Constantinople, those now known as Bodrum Camii and Kilise Camii have almost exactly the same interior features, including the pendentive domes over the spaces flanking the bema, the almost square central bays of the narthex, and the use of the *quadratura* to regulate the plan and section[96]. The Kilise Camii also has almost exactly the same dimensions, and the Bodrum Camii is only slightly smaller[97]. The important differences are the lack of basilical emphasis, the lack of domes over the corner bays of the naos, and, assuming that there was a Lascarid prototype with galleries for Sardis, the lack of galleries in both Constantinopolitan churches. As a further working hypothesis I would therefore like to suggest that the "Mistra church type" was invented by Lascarid court architects in Asia Minor by combining a specific Constantinopolitan inscribed cross church plan, the plan of an early Byzantine column basilica, the five

[95] IDEM 283. Although no direct evidence of galleries was found in the excavations, galleries could nevertheless have existed.

[96] T. F. MATHEWS, The Byzantine Churches of Istanbul. University Park and London 1976, 209ff., 386ff. with earlier references. The application of the *quadratura* to these churches was examined on the basis of the best available published plans, a hazardous method considering the inaccuracies of Byzantine construction and of many modern plans. As in the Mistra group, the basic square is applied also to the cross section, for the width of the naos is equal to its height measured to the major string course under the dome. The entire interior space of the church, including the narthex but excluding the dome, can therefore be inscribed in two adjacent cubes which meet underneath the center of the dome. The observations made in Fn. 32 above are also relevant here.

[97] The measurements were taken from the best available published plans,and should be treated with the same caution advised in Fn. 96 above. The variations in the dimensions of Sardis E and the Kilise Camii are apparently not greater than about 0.50 m, suggesting that a basic unit, perhaps the side of the square which determined the location of the four central columns, was the point of departure for both plans.

domed solution now known in 12th century examples primarily in Greece and the southern Balkans[98], and the gallery solution reminiscent of that found in St. Eirene, the Gül Camii, and Dereağzı[99]. The artificial way of putting features together in an "*ad hoc*" manner[100], without regard to their original context in Byzantine architectural vocabulary seems to me to be atypical in Byzantine architectural history[101], but is entirely consistent with the eclectic approach of Lascarid architects observed above. It is the inventiveness made possible by this approach which seems to be the strong and particular contribution of Lascarid architects.

The plans in Fig. 3—9 (except 4) were redrawn after those shown in EYICE, İzmir; WIEGAND, Latmos; ORLANDOS, Chios; the exact references are given in the footnotes above. No attempt was made to obtain greater accuracy in the dimensions than in the published plans, but numerous overt errors have been corrected, and all plans were drawn and reproduced using the same scale and drafting symbols so that the monuments can be readily compared. The photographs in Figs. 10, 11, 14 and 31 are taken from WIEGAND; Figs. 15—17 and 32 from ORLANDOS; Fig. 30 from LAMPAKIS, Christianika. The remaining photographs were made by the author. The earlier photographs and plans are collected here so that a relatively clear picture of the monuments can be obtained without constant reference to other publications, some of which are not readily available.

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[98] BUCHWALD, Sardis 279ff.

[99] H. BUCHWALD, The Church of the Archangels in Sige near Mudania. Vienna 1969, 52ff. with further references; H. SCHÄFER, Die Gül Camii in Istanbul (*Istanbuler Mitteilungen*, Beiheft 7). Tübingen 1973; U. PESCHLOW, Die Irenenkirche in Istanbul (*Istanbuler Mitteilungen*, Beiheft 18). Tübingen 1977; H. HALLENSLEBEN, Untersuchungen zur Genesis und Typologie des "Mistratypus". *Marburger Jahrb. f. Kunstwiss.* 18 (1966) 105ff., many of whose keen observations are relevant whether or not my speculations about the origin of the type in Asia Minor are correct. While I agree with his observation that the narthex was a later addition at the Afentico, as it was in Latmos churches 4 and 8 and at Krina, in all of these examples the narthex seems to have been planned together with the church and to have been built immediately after the naos, even though the naos may have been built with its own western facade. The church of Saint Sophia in Vize, Turkish Thrace, may occupy an important place in establishing the development of the Mistra type, because its lateral galleries are supported by columns closely comparable to those of the Mistra churches. While its construction date remains uncertain, it may have been built as early as the late 8th or the 9th century, and its articulation seems certainly pre-Lascarid. (MANGO, Architettura 172, T. 184, 185; S. EYICE, Les monuments Byzantins de la Thrace Turque, in: XVIII[e] Corso di Cultura sull'Arte Ravennate e Bizantina. Ravenna 1971, 293ff., both with further references.)

[100] The term is borrowed from contemporary architectural criticism, where it is used to designate the same tendency in some contemporary buildings.

[101] I have attempted to describe the slow, probing, step by step method of achieving new architectural forms, which I find to be more typical of pre-Lascarid Byzantine architecture, in the period between the late 6th and early 10th centuries in BUCHWALD, The Church of the Archangels, particularly 36ff.

VII

The Concept of Style in Byzantine Architecture *

with eight plates

1.

I will begin with several questions. 1. Are stylistic concepts comparable with those used, for instance, in discussions of Gothic or Baroque architecture, employed in the investigation of Byzantine architecture? 2. Are stylistic concepts employed in recent investigations of Byzantine painting and sculpture also used in discussions of Byzantine architecture? 3. Are there concepts of style which are normally used in discussions of Byzantine architecture?

I believe that we can answer each of these questions unhesitatingly with a 'no'. A look at the Tables of Contents of recent, general studies of Byzantine architecture is sufficient to show that concepts of style are used only minimally, if at all.

Which approaches *are* currently used to organize the enormous number of Byzantine architectural monuments, and to provide an overview which is comprehensible? I will briefly outline eight which seem to me to be significant. Obviously they are not mutually exclusive; more than one approach may be used concurrently in a single investigation.

The 'chronological-historical' approach is certainly preferred at present. For instance, in *Early Christian and Byzantine Architecture*, R. Krautheimer titles Part 2 'the Fourth Century', and Part 3 'the Fifth Century'. [304] The next part deals with the architecture of the Justinianic period. For Krautheimer, 'Middle Byzantine' architecture has a precise beginning with the end of iconoclasm and a precise ending with the Latin conquest of Constantinople in 1204, the year with which the final part of the book, written as an epilog, begins.

At first glance, this approach to organizing architectural monuments seems to be convincing, because it divides the material into clearly established, comprehensive categories which are defined, at least to a certain extent, by documented political events. However, no distinctive differences between the

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* This is a free translation of the article 'Der Stilbegriff in der byzantinischen Architektur', which was an almost unaltered manuscript of a lecture given at the *Institut für Byzantinistik* of the University of Vienna in January, 1986. It is therefore presented without footnotes. (Most buildings mentioned are well known and may be found in standard works.) I express my sincere thanks to Prof. Herbert Hunger and his colleagues at the *Institut* for their generous invitation to present the lecture. The original page numbers are provided in brackets in the translated text.

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architecture of the late fourth century and that of the early fifth, or between that of the late fifth century and of the early sixth, have been identified, and some Justinianic architectural features are found earlier. Also, many Byzantine buildings can still not even be dated approximately with confidence. The dating of important examples, such as the Kariye Camii, has been changed by centuries in recent years. Although defining the monuments chronologically within their historical setting is very important in the investigation of Byzantine architecture, it is not satisfactory as the primary principle by which the material is organized.

The second approach to organizing Byzantine architectural monuments may be termed 'geographic'. It is frequently used together with the 'chronological-historical' approach, and shares with it the appearance of empirical precision, because each building obviously has a specific location. The geographic location, and the geographic grouping of monuments is, of course, necessary. However, such observations alone may be misleading, for instance, if we think of examples with characteristic Constantinopolitan features in the provinces, or of cities like Ochrid, which belonged to different realms during different periods.

More important, the 'chronological-historical' and 'geographic' approaches share still another weakness: they tend toward an encyclopedic, undifferentiated enumeration of monuments, and fail to provide insights concerning important relationships, architectural qualities, and other possibilities for evaluating the material.

The third, or 'typological' approach has the same weakness. To make matters worse, the same architectural building type, for instance that of the Byzantine inscribed cross church, was used in churches constructed with an entirely different character in various styles, for instance the Romanesque, Renaissance and Baroque, and also occurs in Ottoman mosques. The exact definition and differentiation of building types remains [305] an important, and still not entirely completed task. But the differentiation of buildings by typology alone is insufficient for organizing the monuments of Byzantine architecture.

Function is always important in architecture, and it is therefore not surprising, that in recent years the purpose and use of various building forms and building parts have been investigated, at times with astonishing success. Without differentiation by function, for instance as churches, residences or fortifications, an intelligible ordering of Byzantine monuments would be impossible. However, especially in Byzantine architecture, our knowledge of the functions of buildings is often based upon various, at times greatly differing assumptions and interpretations. Also, it is probable that in Byzantine times different building forms were used for the same purpose, and that the same building form was used for different purposes. The further study of functional relationships in Byzantine architecture is an important *desiderata*; but certainly it is clear that function can be only a secondary consideration in the organization of Byzantine architecture.

'Symbolic' and 'iconographic' approaches are closely related to the 'functional' approach, and share the same shortcomings. Even though it is

important to continue to expand our understanding in this area, it seems to me that it will be impossible to use insights concerning symbolism or iconography to provide a useful tool for organizing the vast body of Byzantine architecture. At any rate, the symbolic meaning of some of the most important Byzantine architectural forms, such as the dome, are inadequately documented, and we must therefore rely on speculation. For instance, does a wood dome have the same symbolic meaning as one of masonry? If the answer is 'yes', then why were more domes not constructed of wood? They were probably easier and cheaper to build. But if the answer is 'no', then why were domes ever constructed of wood? If the response is that a wood dome may have been better than none at all, then the symbolic meaning of the dome is shaken at its roots, because a qualitative or quantitative dimension to symbolic meaning must surely be excluded. Either a form had symbolic meaning, or it did not. A 'little bit' of symbolic meaning is meaningless.

In the same context the following questions may also be posed: Are two domes over the nave of a church better, in terms of their symbolic meaning, than a single dome? Are churches without domes handicapped, [306] in terms of their symbolic meaning? As these brief observations show, we do not yet understand even the most basic aspects of Byzantine architectural iconography.

The 'socio-economic' approach to Byzantine architecture is sadly underdeveloped, or almost non-existant. I refer to it primarily because this approach has led to interesting results for other periods of architectural history. However, comparable results for the Byzantine period are unlikely because of the lack of adequate written sources. Disregarding these limitations for the moment, it seems to me that, even though the investigation of Byzantine architectural monuments in terms of their social and economic context is certainly desirable and may, perhaps, lead to important new insights, it does not provide a suitable tool for a comprehensive organization of the multitude of Byzantine architectural forms.

By way of contrast, the seventh approach to Byzantine architecture is applied very frequently. It is characterized primarily by the minute examination of quite narrowly defined material. In this approach relatively limited goals are set and very specific areas of interest are investigated. The examination of capitals, of masonry techniques, of individual buildings, or comparisons of floor plan solutions, vaulting forms, proportional systems, or of ornamentation are all good examples. I do not imply that this approach is unfruitful; to the contrary, these methods have led to important contributions and will undoubtedly continue to do so.

However, even with the great number of insights which may be achieved using such methods, and regardless of how precise, thorough and extensive these studies may be, their results are necessarily fragmentary, and must be synthesized into a larger conceptual context. Such a synthesis, on the other hand, lies beyond the goals of this approach. No matter how many insights are gained using such

methods, they will not, by themselves, provide a comprehensive understanding of Byzantine architecture.

Last but not least, stylistic concepts are used occasionally in studies of Byzantine architecture. They are usually borrowed from non-Byzantine architectural developments or from the other arts, and are used without a comprehensive context of architectural stylistic relationships. For instance, the vertical proportions of San Vitale in Ravenna are at times discussed, as are the wide proportions of the Studios basilica in Istanbul, with an implication, in each case, that these characteristics may be due to possible stylistic tendencies. Terms such as 'renaissance' and 'renascences' are occasionally used. Important characteristics of the architectural ornamentation of the Justinianic and other periods have been described [307] in detail and analysed, without, however, relating the ornamental forms to the architectural forms of contemporary buildings.

These occasional observations concerning stylistic qualities make no attempt to develop a comprehensive concept of Byzantine architectural style. On the contrary, they usually remain fragmentary and are often used only to establish chronological sequences.

2.

I have emphasized the shortcomings of these eight approaches without questioning their usefulness. I do not believe that there is a current approach to Byzantine architecture that provides a comprehensive, understandable, even partially satisfactory method of organizing the enormous number of Byzantine architectural monuments. Such a method must above all begin with an observation of the monuments themselves. These observations must be synthesized into succinct units. A clear terminology of style must be developed so that these syntheses can be discussed meaningfully. Only then will an understanding of the manifold relationships between architectural forms of different Byzantine periods, regions and centers be possible. Only then will we be able to obtain an overview of the interdependencies between the architectural forms and the political, socio-economic, religious and other developments of Byzantine history. Only then will we be able to determine standards of quality or to recognize individual creative effort, because only then will we be able clearly to identify the architectural forms and to distinguish one from the other.

I reject the objection that concepts of style cannot yet be developed for Byzantine architecture because the material has not, as yet, been adequately researched. The existing material will *never* be adequately researched. Certainly there will be errors, as there are in all sciences, and current conclusions must be revised repeatedly in the future, if for no other reason than that each generation will approach the problems from its own points of view.

Nevertheless, I believe that it is high time to begin the endeavour, because,

among other reasons, the results will provide useful feedback which will, in turn, influence research on individual monuments. It is a fallacy to believe that comprehensive conceptual synthesis must wait until research on individual buildings has been completed. Rather, the research process itself consists of the constant interchange between obtaining factual information and conceptual, stylistic and other interpretations. I will therefore begin here with a brief, roughly sketched [308] outline of four stylistic currents which are proposed experimentally, as a draft.

To avoid preconceptions concerning the characteristics of the four stylistic currents I will, at least initially, give them neutral, anonymous titles. I propose using numbers instead of names, and will call them Style I, Style II, and so on.

The First Byzantine Architectural Style (Style I) is characterized above all by the use of clear, simple forms of Euclidean geometry. Each portion of a larger space is optically closed, even if it is open to other parts of the larger space. The various parts of a building are usually tightly organized using principles of symmetry and hierarchy. Direct, immediately effective solutions are preferred.

The principle of anonymity controls many of the features, for instance arcades, or windows of the clerestory: each arch and each window in a series is equal to each of the others. Within the series, there is no emphasis, no inherent beginning, middle or end. This creates an intense, unrelenting rhythm and a dynamic sense of motion which requires the observer to move through the space either visually or physically. Even when individual spaces are clearly separated, at the same time often they are open to each other through colonnades or arcades, providing veiled views from one space to the other.

As in all styles, some forms and features of Style I may be traced in buildings of previous decades or centuries. However, in its entirety Style I is new and may clearly be distinguished from the forms of Late Imperial architecture of the previous period in many ways. A comparison between the Constantinian churches and the Basilica of Maxentius, which was constructed only a few years earlier, also with imperial patronage, is particularly telling. The Basilica of Maxentius lacks the clear Euclidean geometric forms, the strong separation between spatial units, the anonymous arcades, the veiled views, the dynamic rhythms.

[309] Style I therefore clearly begins with the reign of Constantine. Its most typical building form is the basilica, exemplified, for instance, in the early fifth century church of Sta Sabina in Rome, which is relatively well preserved. Similar basilicas were erected at least until the end of the sixth century; the well preserved churches in Poreç and Grado (Figs 1–2) are examples. Sta Costanza, built in the fourth century, and Sto Stefano Rotunda of the fifth, both in Rome, demonstrate that the same stylistic characteristics were also used in the construction of centralized churches (Figs 3–4).

Although we can trace Style I continuously for about 300 years, it was the sole Byzantine architectural style for only a relatively short period. Convincing arguments indicate that the church of San Lorenzo in Milan was designed in a

style which differs decidedly from that described above already in the latter part of the fourth century. The same style is evident in a much richer form in the sixth century, for instance in San Vitale in Ravenna, St Sophia in Istanbul, and in other churches in various parts of the Empire (Figs 5–9). In these buildings the clear stereometric forms of Style I are replaced by more complex forms composed of multiple spatial units. Spaces are not neatly separated, but are tied together, often with niches which may be experienced from both sides. Anonymous forms have disappeared; instead, complex rhythms are created using subdivisions which are readily grasped as series of grouped components. The direct, immediately comprehensible solution is replaced by unusual solutions which are subtly conceived. Instead of the logical relationships between support, arch, lintel and wall of Style I, a magical relationship between load and support is suggested, in which the weight of the load is denied. In contrast to Style I, in Style II there is almost constant, and at times fundamental experimentation.

Therefore, in Style II there are enormous numbers of building forms and variations. There is constant striving for new and improved forms. Only seldom are two churches very similar, and the same floor plan is almost never repeated in the same way. The results of these experiments are several almost entirely new solutions.

In St Sophia in Istanbul, for instance, a domed basilica was combined with niches like those of San Lorenzo in Milan. In the church of St John at Alaşehir two huge domes were located over the nave, and side aisles were eliminated. While the nave of St Irene in Istanbul was apparently originally barrel vaulted, the nave of the domed basilica at Philippi, [310] which seems to have been constructed by the same work crew, was covered by a huge groined vault.

Even though many of these churches were constructed during the reign of Justinian, it is an error to call this style Justinianic. We have seen that many of the most important characteristics of the style were already evident in San Lorenzo in Milan in the fourth century, and other pre-Justinianic buildings were clearly also designed with characteristics of Style II.

Not only San Lorenzo in Milan, but also other important examples of Style II were probably commissioned by the Emperor, by the Imperial court, or by circles which either were or wanted to be close to the court. I therefore propose the hypothesis that Style II, at least at the beginning and in its most important examples, emanated from the highest levels of Byzantine society. (It was the 'High Style'.) With time the style may have been used in buildings which were commissioned by lower levels of society, although I am unaware of scholarship which would be useful in supporting such a supposition.

The interesting and varied solutions of Style II cannot be explained by the use of the buildings, for instance, as palace churches. Attempts to justify such explanations have been disproved by Mango and Deichmann. Rather, I believe that Style II was, at least initially, an attempt to make the rather uniform and unpretentious architectural forms of Style I livelier and more interesting, even

though there may also have been other reasons in some examples.

In the same connection it should be emphasized, that the vast majority of buildings were still constructed in the simple, clear forms of Style I well into the seventh century. Both stylistic currents were used side by side, for reasons which remain to be determined. In many buildings attributed to the sixth century and to the seventh only minor forms and ornamentation of Style II were used, somewhat superficially applied to the major architectural forms of Style I.

The end of Style II came neither with the end of the Justinianic dynasty nor with the Persian and Arab incursions. The development of the cross domed basilica, which has the characteristics of Style II, may have been initiated in the sixth century, for instance, in the vaulted reconstruction of the church of the Virgin at Ephesus. The churches of St Clement in Ankara and of the Koimesis at Iznik are examples of the same development which were probably [31] constructed in the seventh century or the early eighth, perhaps in the course of a program of reconstruction after the invasions.

The church of St Sophia in Thessaloniki, which belongs to the same group, was probably not constructed until the late 8th century. Style II therefore continued until at least the late eighth century, and isolated examples like the church at Dereağzi are attributed to the ninth century.

Style III was characterized above all by the harmonious, balanced fusion of the many varied forms used in Styles I and II into a few unified, standard solutions which were used repeatedly (Figs 10–15).

Even though there was occasional experimentation, in contrast to Style II there was no repeated desire to achieve improved solutions. Usually, in Style III, there were only minor variations on well known themes. Strong, probably symbolic geometric forms such as the dome and the cross are clear and distinctive features of the architecture, for instance in inscribed cross churches. But in contrast to Style I, where these symbolic forms are individual spatial components, they are now indivisible parts of a larger, more complex building. Various forms used in previous centuries, such as the dome, the cruciform type, the basilica, and the squinch were amalgamated into new, unified, balanced solutions in which, on the one hand, the origins of the forms were no longer clearly discernable, but on the other hand, their essential features remained well defined.

Structural loads were led down through the building logically, supported by vaults, arches, columns and walls, but the support system was not placed on display, as it was in Antiquity and in Style I. Rather, the experimentation with dematerialization which typified Style II was perfected.

With ingenious solutions such as the inscribed cross church or the squinched church type of Hosios Loukas, highlights of architectural history were achieved which are comparable with the highest accomplishments of other, non-Byzantine periods.

The inscribed cross type dominated church production in Style III from the ninth century until the twelfth. Characteristic examples in Constantinople include

the early tenth-century north church of the Fenariisa Camii and the Kilise Camii, which may have been erected in the eleventh century. For stylistic reasons I would attribute the so-called church of St John in Trullo, which is usually dated to the twelfth century, [312] to the ninth century, making it the earliest church of the type in the capital. I consider the common theory that the first inscribed cross church was the no longer preserved 'Nea' built by Basil I in 880, as untenable, among other reasons because the well known description may also be interpreted otherwise; and even if this church was built on the inscribed cross scheme, there is no reason to believe that it was first of that type.

The church of St John of the Pelekete monastery on the south shore of the Marmara was constructed as an inscribed cross church probably already in the late eighth century, about 100 years before the 'Nea'. On the one hand, church 'H' in Side on the south coast of Asia Minor was clearly constructed on the inscribed cross scheme, while on the other hand it contains minor forms which indicate an early date; it was possibly erected in the seventh century. Of course these early examples in Asia Minor are so poorly preserved that their architectural style cannot be adequately described. Nevertheless, the relevant evidence seems to indicate that Styles II and III existed side by side for an extended period of time. Therefore, a good bit of scepticism is warranted, when chronological attributions of Byzantine architecture are based solely on stylistic observations.

In accordance with the balanced, harmonious and accomplished conception of architecture in Style III, stylistically equally accomplished monumental paintings and mosaics became integral parts of the buildings. The important work by Demus on this subject is still relevant. I wish to emphasize that the mutual adaptation between architecture and monumental painting was characterized not only by an iconographic, but equally by a stylistic component. A pictorial style was developed, of course initially many centuries earlier, which permitted the retention of the clear, architectural surfaces of the 'built geometry' which is essential in Style III.

The picture plane, which is at the same time the surface of the architecture, remains visually unbroken, thereby creating a unique, completely balanced and harmonious relationship between architecture and painting. In painting this is not only due to the fact that there is little or no depiction of spatial depth, of perspective and of the rounded human body. Rather, it is primarily due to the integration of the real, actual space of the architecture [313] into the picture. The holy figures in the mosaics of Hosios Loukas and Daphni do not relate to a space which is illusionistically depicted behind the picture plane; rather, they relate to the immediate, real space in which the beholder stands, the space inside the church, the architectural space. This achievement of balanced harmony between painting and architecture, which I believe to be one of the outstanding accomplishments of Byzantine civilization, must have been based upon a conscious development not only in architecture but also in painting (Figs 13, 17.)

The most typical attribute of Style IV is the repetition of earlier building

forms, although with minor exceptions only Byzantine forms were imitated. For instance, in Constantinople each of the Palaeologan churches was constructed imitating a *different* church type taken from previous Byzantine periods, and there is no evidence for the continuous use of any of these church types there. The best examples of this phenomenon may be found in Mistra in the Peloponnese (Fig. 16). The appearance of unity is given these churches with the application of rich façade ornamentation, which in turn has its origins in the eleventh and twelfth centuries.

Both the ornamentation and the eclecticism of the Palaeologan period can already be traced in the buildings of the Lascarid dynasty in Asia Minor and the Aegean islands. Church E at Sardis, which I published elsewhere, with its rich façade ornamentation, is a good example. It was built in the form of a new church type which appears to have been originated in Asia Minor in a manner which differs radically from that usually used to design Byzantine churches. Whether in Sardis itself or in another Lascarid center, the new church type was designed by eclecticly combining building forms of various periods which were taken out of their original contexts. I do not use the word 'eclectic' disdainfully, but simply to define a specific process of arriving at architectural forms. As may be seen in Church E, creative new forms may be achieved with the help of eclecticism.

More commonly in Style IV, forms were directly imitated from those of only a single architectural type of the Byzantine past. For instance, on an island on Lake Latmos Church No. 8 of the mid-thirteenth century was erected on the inscribed cross scheme even though there is no evidence of a tradition for the type in this part of western Asia Minor. I would conjecture that this building type [314] had an aura of tradition, and that it nostalgically reminded Lascarid patrons of the better times of the Byzantine past, which were more secure and militarily more successful. Similar reasons may have been behind the choice of forms for the Lascarid church at Krina on Chios.

The nostalgic eclecticism of Style IV did not commence with the fall of Constantinople to the Latins in 1204. The Kalenderhane Camii in Constantinople, which was erected in the late twelfth century, was designed using earlier Byzantine church forms, probably of the eighth or ninth century. That is why it has usually been mistakenly dated to the earlier period. It remains unclear to what extent such retrospection was common before the thirteenth century. At any rate, on the Byzantine periphery such as Venice and Apulia a similar type of eclecticism occured at least occasionally already in the eleventh century. San Marco in Venice is a good example, and the Cathedral of Molfetta was apparently constructed imitating earlier examples in Asia Minor.

In Style IV the harmonious union between architecture and monumental painting which we have observed in Style III was utterly destroyed. Painting became independent. The picture plane was dissolved by the use of strong, realistic surfaces, and could therefore no longer be experienced as the unbroken surface of architectural geometry. The depicted human body, with its plasticity and

modelling, stepped behind the surface of the picture plane, and thereby marked the beginning of the development of spatial illusion which reached its high point only during the Baroque period in Western Europe. The repeated use of pseudo-perspective in architectural representations in Palaeologan painting also contributed to the break in the balance between architecture and painting. Never again were these two arts completely and harmoniously united (Fig. 18).

3.

Obviously each of the four major stylistic currents contains a number of sub-currents which need to be identified in the future. I have already attempted to define some of them, particularly for Asia Minor, in previous publications.

[315] In other, non-Byzantine periods, normative developmental styles have been identified, such as archaic, classical, mannerist, and baroque, often in that sequence. The question may therefore be posed whether similar stylistic tendencies may also be found in Byzantine architecture. I believe that all of these tendencies may be observed in Byzantine architecture. The simple, stereometric forms of Style I, particularly during the Constantinian period, could be called 'archaic'. Within the entire span of Byzantine architecture there is probably only one style which could be called 'classical', the early phase of Style III, around the ninth century; the church now known as the Fatih Camii (St Stephen's?) at Zeytinbagi (Tirilye) on the Marmara and the church at Skripu are good examples. It would be possible to interpret the steep proportions of the Fenariisa Camii North Church as 'mannerist'. But 'mannerist' examples may also be identified in other periods, for instance in the façade of the fourteenth-century exonarthex of the Kilise Camii in Istanbul. Even though there is nothing, in Byzantine architecture, comparable with the Roman or Austrian Baroque styles, there are tendencies in the same direction, for instance in the church of St Catherine in Thessaloniki, with its powerful domes and segmental gables.

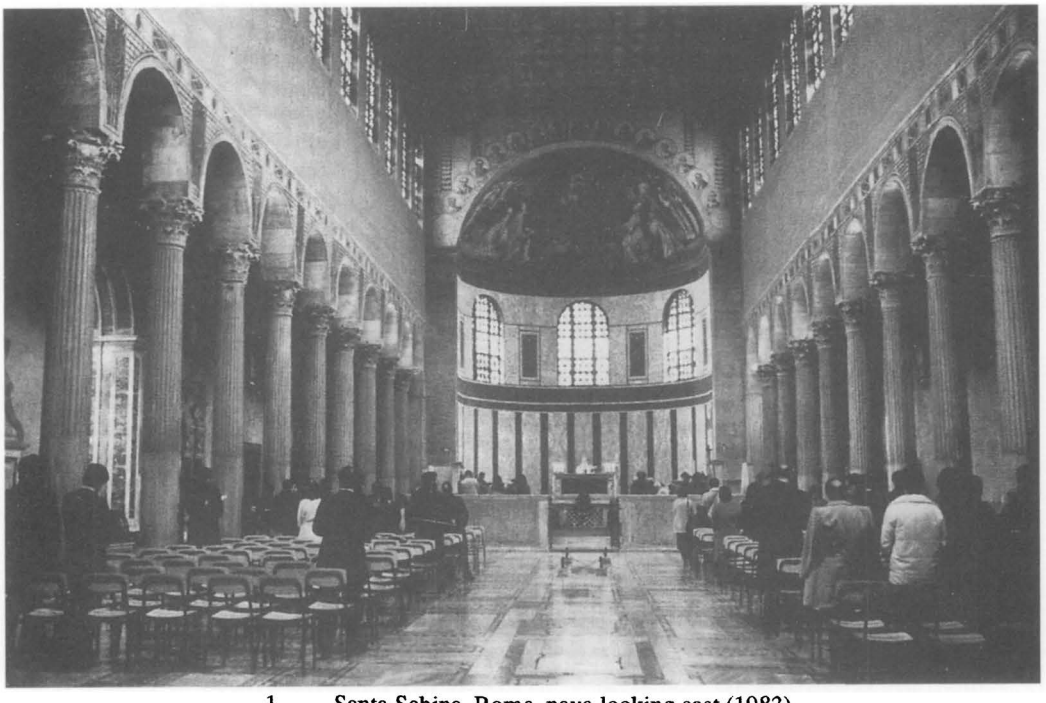
However, these examples are not entirely convincing. Style II, with its many innovations, is entirely omitted. Mannerist tendencies may be found in the tenth, but also in the fourteenth and in other centuries. Byzantine architectural production, which lasted over one thousand years, is too complex and varied to be interpreted in such schematic terms. Nevertheless, future investigations of Byzantine architectural style may find new approaches and new insights in this direction.

I believe that, in the current state of our understanding, it is equally untenable to assume that the styles of Byzantine art and of Byzantine architecture developed parallel with each other. Of course it is possible to find parallels between, for instance, the geometric forms of Style I and contemporary frescoes and mosaics, and I have already pointed out the union between painting and architecture in Style III. The artistic and architectural products of every period must have

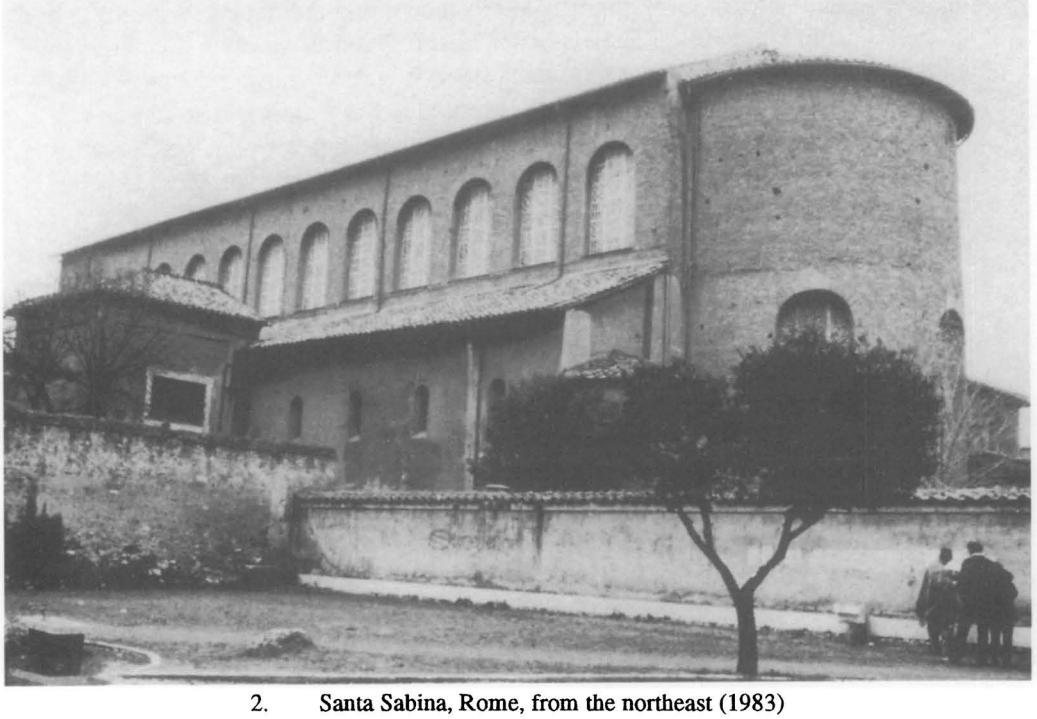
similarities, since they are created by the same society in the same spirit. However, as my previous discussion clearly demonstrates, the terms 'Early Byzantine', 'Middle Byzantine' and 'Late Byzantine' are not suitable to describe Byzantine architectural styles. Iconoclasm left no identifiable imprint on Byzantine architecture, and essential characteristics of Palaeologan architecture exist [316] already before the Latin conquest of 1204. Also, the Byzantine architectural styles exist parallel with each other for centuries. We must therefore assume that Byzantine architecture developed *independently* of the other arts. This independent development should have its own terminology.

I suggest the following. Style I produced *the basic forms and set the foundations* which underly the entire further development of Byzantine architecture. Style II is *analytical*: It probes the many possibilities technically, iconographically, and also aesthetically. Style III is *synthetic*: The many possibilities are filtered, the most usable are chosen, amalgamated, refined to perfection and then varied. Style IV is retrospective and repeats the forms of earlier periods, but at the same time it develops them in various directions which were not previously exhaustively explored.

Byzantine architecture differs from comparable developments in the West not only because of its continuity over a thousand years. Equally unusual is the fact that, with minor exceptions, during this entire period the focal point of development was a single city, Byzantium-Constantinople. From that point of view, the architectural development described certainly did not end with the end of the Palaeologan dynasty. The history of the city did not end with the Ottoman conquest. On the contrary, the Ottomans filled it with new life, new power and new architecture, architecture which was rooted in the history of the city and its historic buildings. An account of the fascinating encounter between the Ottomans and the architectural achievements of their predecessors, however, would lead us beyond the aims of this investigation.

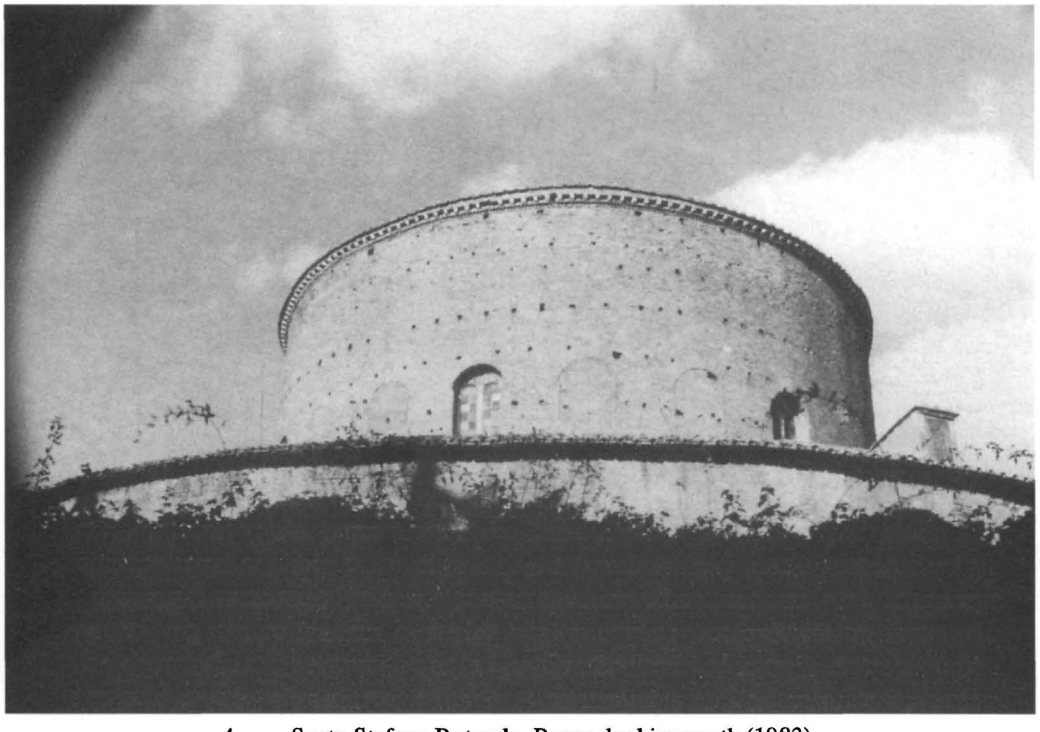


1. Santa Sabina, Rome, nave looking east (1983)



2. Santa Sabina, Rome, from the northeast (1983)

3. Santo Stefano Rotondo, Rome, central space and ambulatory (1983)



4. Santo Stefano Rotondo, Rome, looking north (1983)

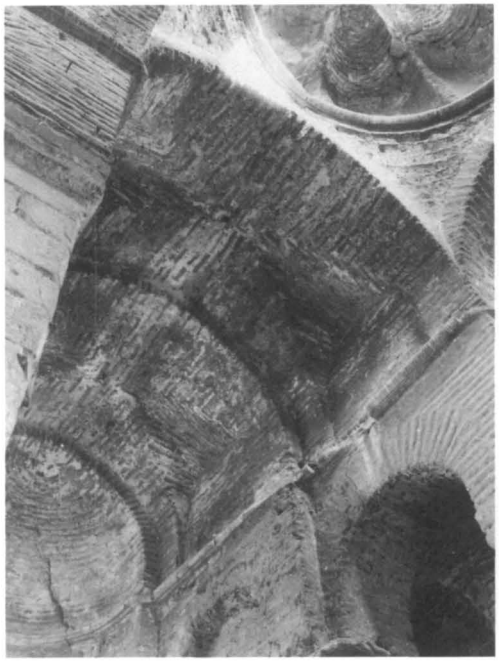
5. Sts Sergios and Bacchos, Istanbul, nave looking northeast (1957)

6. Sts Sergios and Bacchos, Istanbul, nave looking southeast (1957)

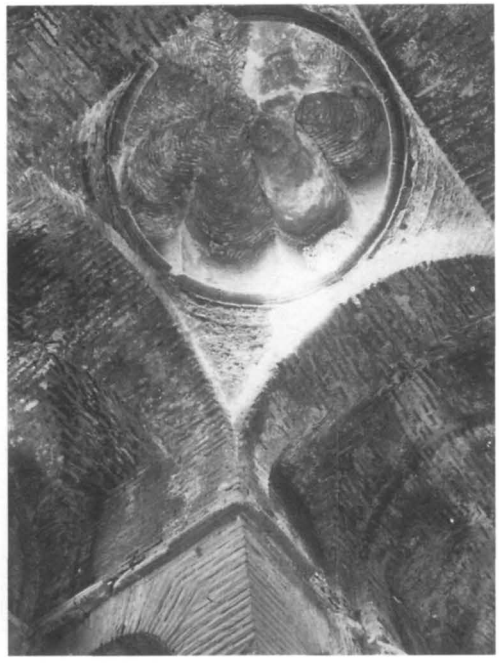
7. San Vitale, Ravenna, looking southwest (1985)

8. St Eirene, Istanbul, nave looking northwest (1975)

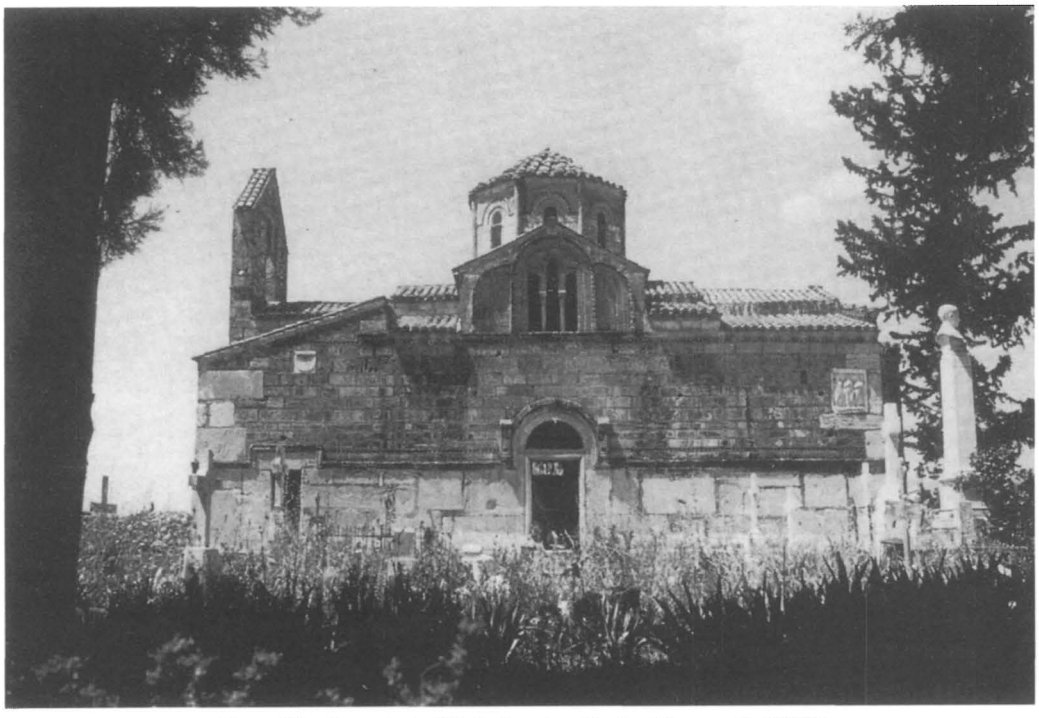
9. St Eirene, Istanbul, looking southwest (1975)



10. The Myrelaion, Istanbul, nave and bema looking southeast (1960)

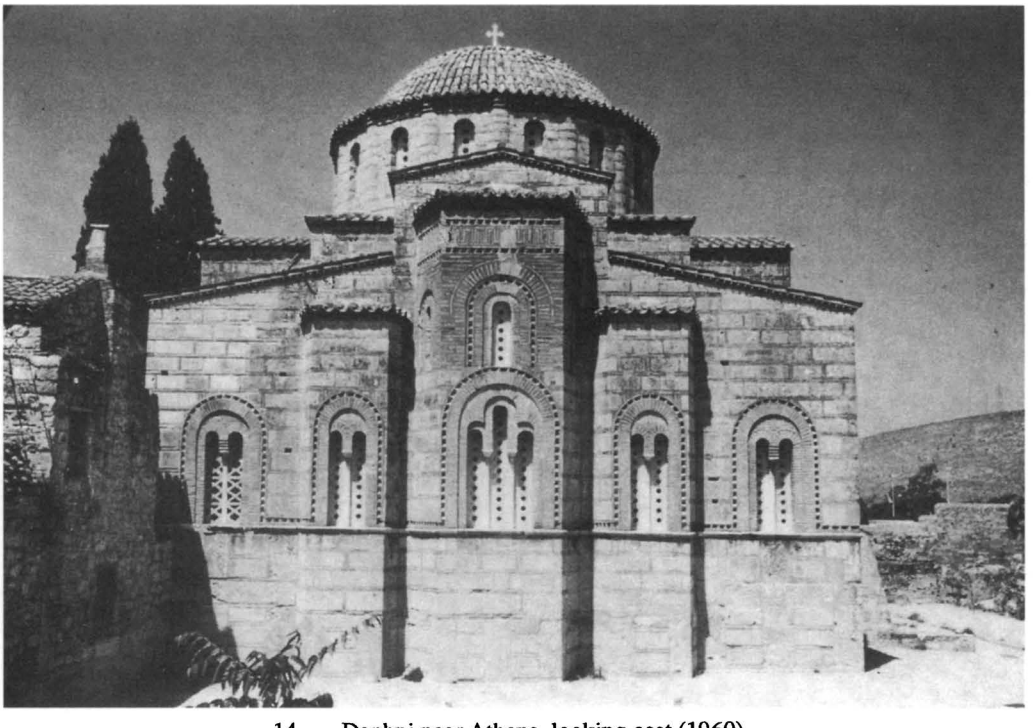


11. The Myrelaion, Istanbul, nave and dome looking southeast (1960)

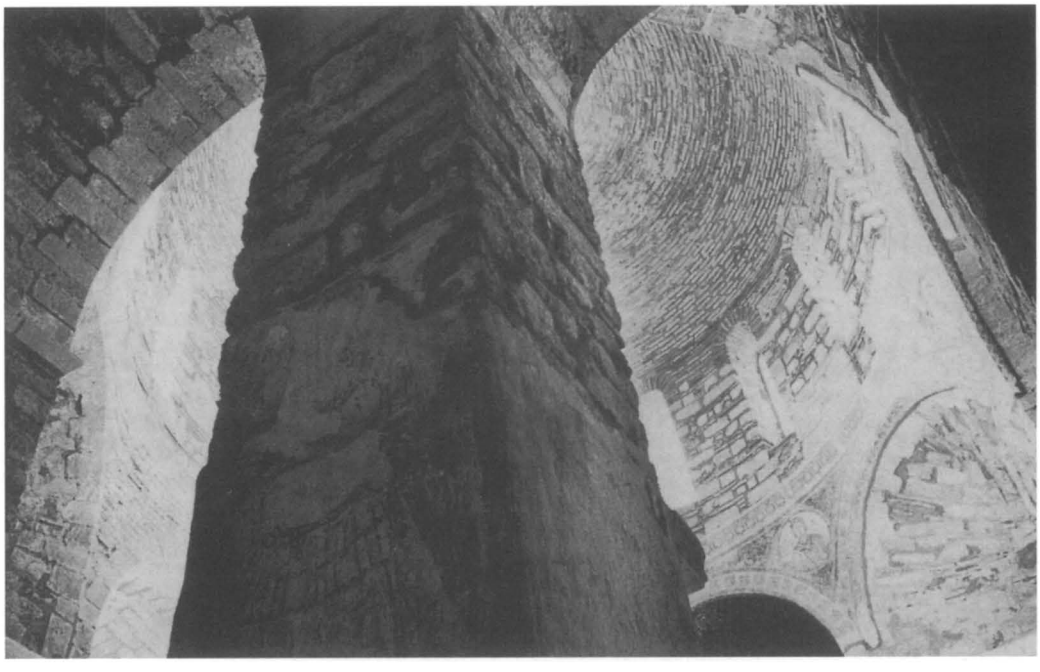


12. The Panagia in Merbaka, Argolis, looking north (1960)

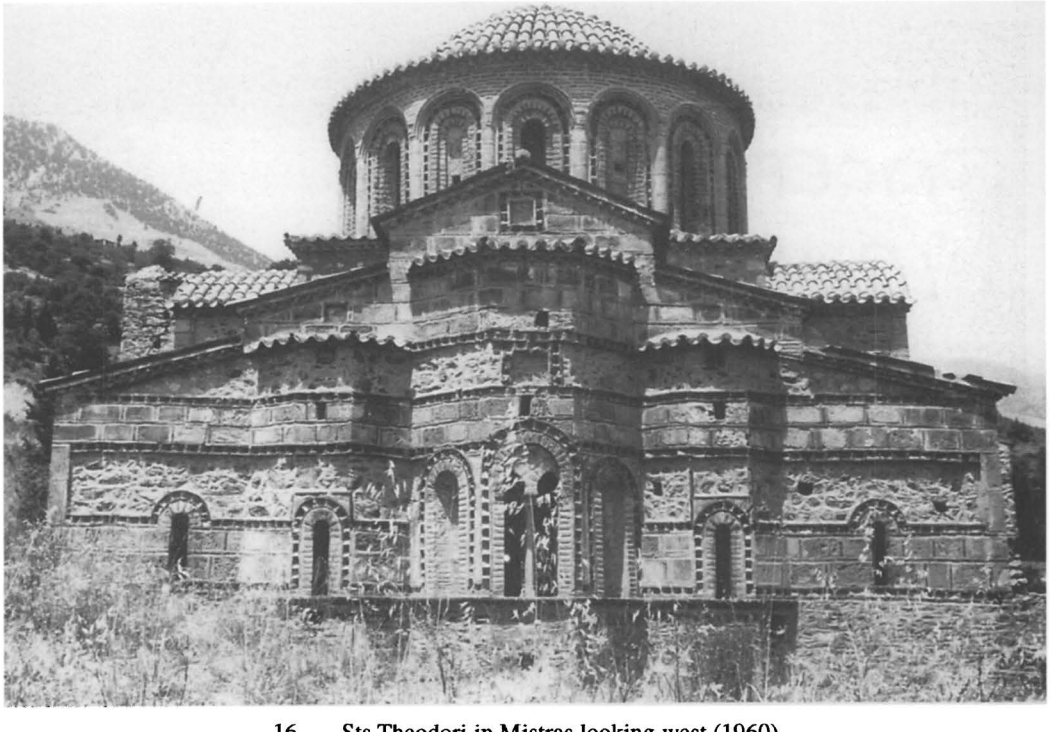
13. Katholicon of Hosios Loukas in Phocis, nave looking southeast (1957)



14. Daphni near Athens, looking east (1960)

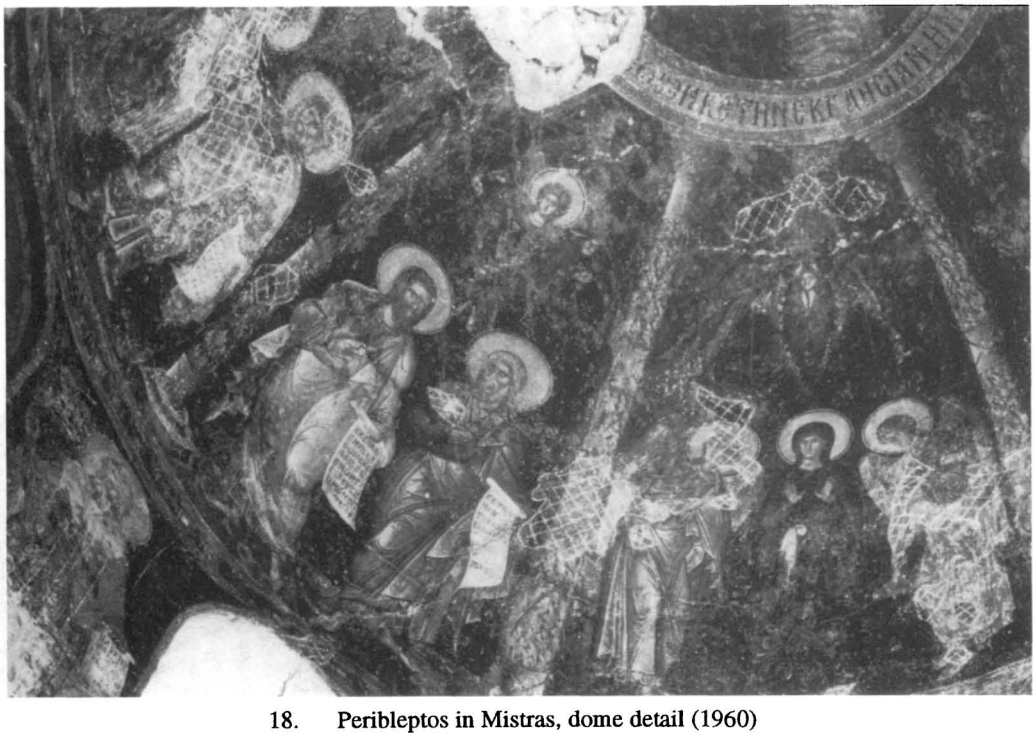


15. St Sophia in Monemvasia, nave looking east (1960)



16. Sts Theodori in Mistras looking west (1960)

17. Katholicon of Hosios Loukas in Phocis, bema dome detail (1960)



18. Peribleptos in Mistras, dome detail (1960)

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VIII

Retrofit - Hallmark of Byzantine Architecture?

In recent architectural projects the term *retrofit* has been used to describe radical transformations of existing buildings. For instance, a railway station may be transformed into a shopping mall, a factory into a theater, or a church into a coffee house. Essential components such as the façade, important rooms or a monumental staircase of the existing building may be retained and emphasized, while other features may be changed, at times completely, to fit a new design image or new functional requirements.

Frequently the interface between old and new forms and functions produces new architectural qualities and new meanings which a new building, such as could have been erected to fulfill the new demands, would not have had. The conversion of a church, as one example, into a coffee house not only provides a striking setting, but also makes a clear statement concerning contemporary values. Retrofit architecture has occurred occasionally in many periods, but it is more frequent during some times than others. Many retrofit projects, for instance, have been produced in the past 20 years, transforming buildings which would have been demolished in the 1950s or 1960s. Although at times it may be financially advantageous to retrofit a building, frequently there are other overriding reasons for doing so. At least in recent years it is often more cost effective to replace than to retrofit a building.

From this thumbnail sketch it becomes evident that there are three primary preconditions for retrofit architecture: 1. There must be an abundant number of suitable buildings from an earlier period; 2. Significant changes in attitudes, technology or life styles must make the earlier buildings obsolete; 3. Earlier buildings must be valued, whether for aesthetic or other reasons, making it more desirable to retain than to replace them.

Each of the three preconditions for retrofit architecture was satisfied during the Byzantine period. A substantial number of suitable earlier buildings existed in most Byzantine cities. Because of Christianity, and also for other reasons there were significant changes in attitudes and life styles, making many earlier buildings obsolete. At least some earlier buildings were valued in spite of their obsolescence, since they continued to be used, often in a radically changed form.

Indeed, Byzantine civilization can be seen as a Christian *retrofit* of Roman civilization, in which the Roman structural shell was transformed to suit the new forms and functions required by the new religion. As is well known, many Byzantines thought of themselves as Romans who had become Christians,

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2 RETROFIT - HALLMARK OF BYZANTINE ARCHITECTURE?

Byzantine emperors were viewed as Christian Roman emperors and Constantinople was referred to as New Rome. Byzantine artists continued to illustrate figures and backgrounds as if nothing had changed since the days of Imperial Rome, well into the medieval period. Retrofit can be understood as one of the key features of Byzantine civilization. The question, to what extent the term retrofit describes Byzantine architecture is therefore of obvious interest.

1.

The most conspicuous use of retrofit architecture during the Byzantine period was the conversion of Ancient temples into churches. Of the many dozens of examples which may be cited, those that are of greatest interest in our context include the Parthenon at Athens, the Temple of Apollo at Didyma, the Temple of Athena at Syracuse, the Temple of Olbian Zeus at Uzuncaburç and the Temple of Aphrodite at Aphrodisias. We will not be concerned here with the specific circumstances of the conversions, which have received considerable attention and are usually proposed as taking place between the fifth century and the seventh.[1] Rather, we will concentrate on how the conversions were achieved architecturally, and what conclusions may be deduced from the architectural evidence.

The architectural changes implemented to transform the Parthenon into a church were minimal, including primarily the installation of new doors, an apse, galleries and a roof over the nave (Fig. 1). The exterior appearance of the building remained almost unchanged. For the most part the Christian worshipper saw only Classical forms in the converted Parthenon.[2]

The direction of the building was reversed, with the main entrance now from the west instead of the east, providing a direct approach from the Propylaeum. The church was entered through the opisthodomus, which remained unaltered, its four columns emphasizing the direction of the nave and altar more forcefully than would have been the case in a standard narthex of the period. Three new doors opened into the west wall of the former cella, which was transformed into the nave and side aisles. On the west side of the nave one column was removed to provide a solution which echoed the tribelon common between the nave and narthex in contemporary basilicas. An apse with a polygonal exterior, which opened to the cella through the original east door, was constructed in the pronaos.

1. See, for instance, F.W. Deichmann, 'Frühchristliche Kirchen in antiken Heiligtümern', *Jahrbuch des deutschen archäologischen Instituts,* 54 (1939); J.-M. Spieser, 'La christianisation des sanctuaires païens en Grèce', *Neue Forschungen in griechischen Heiligtümern* (Tübingen, 1976) 309-20, each with references to earlier studies, and notes 2-7 below.

2. F.W. Deichmann, 'Die Basilika im Parthenon', *Athenische Mitteilungen,* 63-4 (1938-39) 127-39, for a detailed account of the changes and the available evidence; A. Frantz, 'From Paganism to Christianity in the Temples of Athens', *Dumbarton Oaks Papers,* 19 (1965) 185-206; *idem, Athenian Agora, Results of Excavations, Late Antiquity, A.D. 267-700* (Princeton, 1989); I. Travlos, 'Athen', *Reallexikon zur byzantinischen Kunst,* 1 (Stuttgart, 1966) 357-8.

The architect who converted the Parthenon used the existing conditions to great advantage. He dramatically emphasized the processional spatial sequences required by the Christian ceremonies with his limited, carefully considered transformations. We have already noted that a heightened architectural quality may be observed in many retrofit projects, a quality which could have been achieved neither by retaining the traditional function of the existing building, nor by erecting a new building. This heightened quality was achieved in the Parthenon conversion with the striking contrast between the Classical forms, which were over 800 years old when the building was converted, and the entirely new, dynamic spatial relationships which reflected those of a standard Christian basilica.

F.W. Deichmann noted that the extensive preservation of Classical forms in the converted Parthenon may be explained by the strong tradition of 'Hellenism' in Athens.[3] While this explanation is reasonable, it is immediately apparent that the Parthenon could hardly have been converted to a church more economically, with fewer construction changes.

When the Temple of Apollo at Didyma was converted into a church even more of the original temple was preserved than in the Parthenon.[4] The conversion required no known changes to the temple building. As far as we can tell, on the exterior an observer would not have noticed that the building had been converted. But upon entering the central part of the temple he would have seen a completely new free-standing medium sized basilican church erected inside the unroofed adyton, where formerly the oracular sacred spring and the naiskos were located (Figs 2-3). The dramatic impact of the changes noted in the Parthenon would have been much greater in the Didymaion, where entirely different means were used to achieve the conversion.

The new components of the church included the exterior walls, a nave, side aisles, colonnades, galleries, an apse and narthex; in addition, a small free-standing baptistery was erected west of the new façade. The walls of the adyton were integrated into the new walls only for a short distance, and otherwise served to define an enclosure, or frame around the church. The apse and the eastern ends of the nave and side aisles stood on steps which led from a small chamber between the pronaos and adyton down to the adyton floor, which was almost 3 meters lower, at about the same level as the church floor.

The solution at the Didymaion required much more new construction than in the case of the Parthenon, but it is clear that because of the sunken floor of the adyton at Didyma, any other solution would probably have required the formidable effort of filling in the adyton to raise its floor. The huge size and unroofed form of the adyton in the Temple of Apollo were preconditions for the solution

3. Deichmann, 'Die Basilika im Parthenon', 139; Frantz, 'From Paganism to Christianity', *passim* for documentation of the persistence of paganism in Athens well into the sixth century.
4. H. Knackfuss, 'Das Heiligtum nach dem Aufhören der Arbeiten am Tempelbau' *Didyma*, T. Wiegand, ed. (Berlin, 1941) 11-45; I have retained Knackfuss' term 'adyton' for the atypical open courtyard in the center of the Didymaion even though it is not fully applicable.

used; a medium sized aisled basilican church would not have fitted into the equivalent locations of other Ancient temples. Even though today, in retrospect, the solution employed for the Didymaion conversion appears to be the most viable that could have been used, it was the insight of the architect that recognized the potential of the site conditions and created the unique, dramatic transformation.

In the conversion of the Temple of Athena into the Cathedral of Syracuse, perhaps the only one of its kind which is still in use, yet another, and very different approach was used. [5] Arcades were cut into the walls of the cella to open it to the side aisles, which were enclosed by new walls between the peristasis columns. The east columns of the pronaos were removed to make way for a new apse. As in the Parthenon conversion, the church was entered through the opisthodomus. The Doric columns and entablature of the peristasis remained partly exposed on the interior and exterior, and the two western columns in antis were preserved half encased in the new west wall of the nave (Figs 4-5).

In contrast to the Parthenon and Didymaion, in Syracuse after the conversion only fragmentary parts of the former temple could still be seen. But before we conclude that the changes in Syracuse reflect the fact that the Christians of Syracuse had weaker ties to their 'Hellenic' past than those at Athens and Didyma, we should consider the differences in the site conditions. The temple in Syracuse was much smaller than the Parthenon or the Didymaion. The cella of the Parthenon had interior columns which could readily be used, or altered, to provide the colonnades dividing the nave from the side aisles. The temple in Syracuse had no comparable interior colonnades. The construction of new colonnades inside the cella at Syracuse would not have been feasible without unduly diminishing the nave width. [6] It is apparent that in the conversion of the temple at Syracuse the numerous changes were necessary to obtain a church with standard basilican forms and suitable dimensions. The conversion in Syracuse was implemented in the most economical and most reasonable manner possible under prevailing conditions.

The conversion of the Temple of Olbian Zeus at Uzuncaburç (Diocaesaria in Cilicia) was similar to that at Syracuse, but the transformations were more radical. [7] The cella walls were entirely removed and new colonnades were

5. S.L. Agnello, 'Architettura paleocristiana e bizantina della Sicilia', *IX Corso di Cultura sull' Arte Ravennate e Bizantina* (1962) 53-108; G. Agnello, *Guida del Duomo di Siracusa* (Syracuse, 1964) for additional illustrations. The church became a cathedral under Bishop Zosimus in the seventh century, but the temple conversion could be earlier. The church was dedicated to the Virgin; changes were made in the twelfth century, the fourteenth, after the earthquake of 1542, in 1718, in the nineteenth century and early twentieth.

6. The clear width of the cella at Syracuse was about 9.60 m, that of the Parthenon 18.00 m, that of the adyton at Didyma about 22.31 m.

7. J. Keil, A. Wilhelm, *Denkmäler aus dem rauhen Kilikien. Monumenta Asiae Minoris Antiqua,* 3 (Manchester, 1931) 47, figs 67-68, pl. 23-24, including drawings and observations by E. Herzfeld of 1906; S. Hill, *The Early Byzantine Churches of Cilicia and Isauria. Birmingham Byzantine and Ottoman Monographs,* 1 (Aldershot, 1996) 252-54 for a summary of recent studies.

constructed using the foundations of the walls as stylobates. The material from the cella walls was salvaged and reused to construct the outer walls of the church between the columns of the peristasis, leaving the columns partially exposed as in Syracuse. On the west two peristasis columns remained unencumbered to provide a monumental entrance into the narthex. After removal of the two central columns on the east side of the peristasis a single apse with integrated flanking chambers was added (Figs 6-7).

On the interior the new church looked like a standard aisled basilica of the period, albeit with proportions derived from the heights of the peristasis columns, which remained partly visible in the aisles. But on the exterior the half exposed peripteral columns on three sides of the church and the free standing columns at the entrance to the narthex must have produced a strikingly monumental, Classical appearance which is still echoed in the remains.

As at Syracuse, the cella of the temple at Uzuncaburç lacked interior colonnades which could have been employed to separate the nave from the aisles, and the cella was not wide enough to add interior columns. The extensive changes required to convert the temple into a basilican church were, for the most part, dictated by the preexisting architectural features.

A radically different approach was chosen in the conversion of the Temple of Aphrodite into a church, probably the cathedral, in Aphrodisias. The cella walls were entirely removed, the columns on both sides of the peristasis were retained as the colonnades separating the nave from the side aisles, and new exterior walls were constructed outside the peripteros on all sides of the church. With great engineering skill and enormous effort the columns of the peristasis short ends were relocated to extend the length of the nave. A new inscribed apse with integral side chambers was added at the east, and an atrium, narthex and other features at the west (Figs 8-9). [8]

With these changes width and length of the new church were much greater than those of the temple. The church was also probably much higher, because the outer aisle walls must have been as high as the peristasis [9] and the clerestory walls of the nave appear to have been about 5.00 meters higher than the temple

8. R. Cormack, 'The Temple as the Cathedral', *Aphrodisias Papers. Journal of Roman Archaeology, Supplementary Series 1*, C. Roueché and K.T. Erim, ed. (1990) 75-88 for a description and discussion of the conversion, including other aspects of the church which depend upon pre-existing features; *idem*, 'The Classical Tradition in the Byzantine Provincial City: the Evidence of Thessalonike and Aphrodisias', *Byzantium and the Classical Tradition. University of Birmingham Thirteenth Spring Symposium of Byzantine Studies*, 1979, M. Mullett and R. Scott, ed. (1981) 103-118; K.T. Erim, '1971 Excavations at Aphrodisias in Caria', *Türk Arkeoloji Dergisi*, 20 (1973), fig. 23 for the floor plan; C. Roueché, *Aphrodisias in Late Antiquity. Society for the Promotion of Roman Studies, Journal of Roman Studies, Monographs*, 3 (Oxford, 1989) 92-9 for inscriptions which may, perhaps, be attributed to the conversion.

9. If we assume that a level ceiling or an open wood truss with a level lower chord spanned from the exterior walls to the peristasis, then the exterior walls must have been as high as the tops of the peristasis entablature.

entablature. [10] The impressive Aphrodisian conversion provided a nave which was almost twice as wide as that of the Parthenon and more than one third longer. The new church was one of the largest in western Asia Minor.[11] Because of the changes, on the exterior the temple was no longer visible after it was converted into a church. To the contemporary inhabitants of Aphrodisias it would have appeared to be engulfed or swallowed by the new building.

On the interior, however, the image perceived by the Aphrodisian worshipper was quite different. The temple columns seem to show no signs of the attachments which would have been required for the construction of galleries; they therefore were probably visible from both sides, from the nave and side aisles, standing unencumbered to their full original heights. By completely removing the cella walls, the architect of the conversion achieved an entirely new way of experiencing the peristasis columns of an Ancient temple (even though that was probably not his primary concern). Employing the columns of the peristasis as the colonnades between the nave and side aisles provided a new, striking, monumental effect.

In Aphrodisias the contrast between the elimination of Ancient features on the exterior and the retention of Classical components and monumentality on the interior makes a strong architectural statement. Here the contrast between the interior and exterior can be seen as a reversal of that employed in the conversion of the Didymaion, where the Classical forms prevailed on the outside rather than on the inside. The element of surprise when entering the buildings, both at Didyma and Aphrodisias, may best be compared with that experienced in some churches of the Baroque period in Italy, Austria and southern Germany.

The contrast also appears to make a clear statement concerning the relationship between Christianity and the pagan Classical tradition. We need hardly be reminded of the fact that in the Temple of Aphrodite the Christian worshipper would have been particularly aware of the pagan past in one of its most abhorrent manifestations. R. Cormack, in his discussion of the conversion of the temple at Aphrodisias, suggests that the retention of major Classical features communicated to the Byzantine observer the victory of new over old. [12] The message which the converted temple seemed to be conveying is that Christianity is far mightier than paganism. That message could best be conveyed not by eliminating all vestiges

10. The cill of one of the apse windows is preserved in the apse wall. Assuming normal window proportions, the apse wall must have been high enough to further assume that the seat of the apse vault was approximately level with the peristasis entablature. The top of the apse vault and of the clerestory wall would then probably have been slightly higher than the radius of the apse, which is about 5 m.

11. The nave at Aphrodisias measures about 15.00 x 47.50 m, that of the Parthenon about 9.00 x 28.00 m; see also H. Buchwald, 'Notes on the Design of Aisled Basilicas in Asia Minor', *Studien zur byzantinischen Kunstgeschichte. Festschrift für Horst Hallensleben zum 65. Geburtstag*, B. Borkopp, B. Schellewald, L. Theis, ed. (Amsterdam, 1995) 19-30, Tables 1 and 2 for characteristic sizes of aisled basilicas in western Asia Minor [V in this volume].

12. Cormack, 'The Temple as the Cathedral', 84, 88; similar views are expressed and documented in F.W. Deichmann, 'Il materiale di spoglio nell'architettura tardoantica', *23 Corso di Cultura sull'Arte Ravennate e Bizantina* (1976) 131-45, particularly 140-5.

of the Ancient forms, but by retaining, employing and displaying them in their beauty and splendour, and at the same time by containing and dwarfing them with the much vaster forms of the new church building.

Yet in Aphrodisias, as in all our other examples, the solution was unavoidable in many respects. The cella of the Temple of Aphrodite was only about 6 m. wide, not enough for the nave of a major church, and it therefore had to be entirely removed. Because of its meagre dimensions, replacing it with a new colonnade as in Uzuncaburç would not have been a viable solution. Retaining the flanking colonnades of the peristasis was a reasonable and economical approach because removing the columns would have required considerable effort, and new colonnades would have been needed. The construction of the outer walls was also necessary. However, other changes were not unavoidable, for instance the lengthening of the nave and the attachment of the apse unit at the end of the peristasis rather than in the pronaos as in many other examples. In these changes it is evident that the intention of the conversion at Aphrodisias was to provide an exceedingly large church which engulfed the former temple.

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Based upon the five examples we have chosen (not necessarily at random) we can make observations which provide insights into the use of retrofit architecture in the Byzantine period. First, and perhaps most important, the conversions included the most prominent and best known temples of Antiquity. The conversions also included important churches and cathedrals in prominent locations in major cities. The conversion of temples into churches was obviously significant not only in providing places of worship in early Christian communities, but also in achieving exceptional architectural solutions.

The basilican church form was used in each of the noted conversions, whether the new arrangement required only limited changes to the existing temple, as in the Parthenon, or whether a completely new church was constructed, as at the Didymaion. Some of the examples, for instance Syracuse and Uzuncaburç, could have been transformed with much less effort into churches without basilican colonnades and side aisles, albeit in a smaller format. The standard components of Christian basilicas, a nave, side aisles and an apse could, therefore, be interpreted as features which were necessary when transforming a temple into a church.

This observation could shed new light upon how the basilican church type was perceived in the fifth, sixth and seventh centuries. It has been viewed in recent investigations as a utilitarian scheme, which could be easily constructed with limited architectural expertise using standard principles of layout, proportion and construction. In its simpler manifestations, without transepts, complex apse solutions or vaulting it was unusually well suited for mass production at a time

when many new churches were required throughout large parts of the Empire [13].

Our observations concerning temple conversions could, however, imply that the aisled basilican church was not viewed only as a utilitarian building type. The aisled basilica could also have been understood as the exemplary Christian church form. The temple became a church, according to this interpretation, among other reasons because it had the standard features of an aisled basilica. The forms of the aisled basilica could have connotated 'church' and could have been used as a symbolic gesture which would have been generally understood.

In support of this interpretation it should be noted that side aisles and colonnades were not universal features of churches in the geographic area being considered. For instance, the Church of St John the Theologian in Philadelphia (Alaşehir), which was probably a cathedral like the temple conversions in Syracuse and Uzuncaburç, was a new church erected during the same approximate period without side aisles and colonnades. [14] The implication could be that by using side aisles and colonnades in the temple conversions the new use of the building was emphasized, an emphasis which was unnecessary when the building was originally constructed as a church. On the other hand, examples of temples which were converted into churches without side aisles, for instance the 'Theseum' at Athens[15] and the Temple of Augustus at Ankara [16] suggest that side aisles were not necessary features of temple conversions. Side aisles could have been used simply to provide more spacious solutions.

In much the same way as the standard features of aisled basilicas could, perhaps, have signalled the new Christian use of the building, the columns of the peristasis seem to have signalled that the building had been a temple. Rather than any other part of the temple they appear to have been perceived as components which most directly reflected the Classical tradition. Most of the peristasis columns remained at least partly exposed in each of the described examples, in contrast to the walls of the cella and adjacent rooms, which were either razed or significantly altered in Syracuse, Uzuncaburç and Aphrodisias.

The rules of thumb that were convenient tools employed in the design of standard basilican churches [17] were insufficient when a temple was to be converted into a church. The design of a temple conversion was far more challenging than the design of a standard Christian basilica. The existing conditions differed at

13. C. Mango, *Architettura Byzantina* (Milan, 1974) 66-7; *Byzantine Architecture*, first paperback ed. (London, 1986) particularly 40; Buchwald, 'Notes', *passim*.
14. H. Buchwald, 'The Church of St. John the Theologian in Alaşehir (Philadelphia)', *Jahrbuch der Österreichischen Byzantinistik*, 30 (1981) 301-318. [II in this volume].
15. See Frantz and Travlos, n. 2 above.
16. S. Güven, 'Displaying the Res Gestae of Augustus, a Monument of Imperial Image for All', *Journal of the Society of Architectural Historians*, 57:1 (March 1998) 28-45; M. Restle, 'Ankyra', *Reallexikon zur byzantinischen Kunst*, 1 (Stuttgart, 1966) 171-2; according to Restle, in Ankara the peristasis columns were not retained, perhaps because they were no longer preserved when the temple was converted into a church.
17. H. Buchwald, 'Notes', *passim*.

each site and had to be carefully considered to achieve an optimum solution even though the solution employed may, in retrospect, seem obvious. Often, for instance in the Parthenon and in Syracuse, the most cost effective solution was used. However at times, for instance in Aphrodisias, an ingenious scheme was devised requiring great skill and considerable effort, a scheme which went far beyond the minimum requirements.

In all of the examples described, whether only limited changes were made or whether the building was extensively rebuilt, the contrast between the Classical remains of the original temple and the new church solution produced previously unknown architectural relationships. These relationships differed in each converted temple. In the Parthenon the Classical forms were almost entirely retained, but were experienced in a new way, in new spatial sequences. In the Didymaion the Classical forms were retained, juxtaposed against the new basilican church which stood, like a stage set, inside the adyton. In Syracuse and Uzuncaburç the partially exposed peristasis columns signalled the fact that the church had been a temple even though inside the nave no vestige of Classical forms was apparent. In Aphrodisias the peristasis columns were retained, partly relocated, and displayed from new and unaccustomed points of view as striking features of the converted building which contained no other visible references to the former temple.

We can only speculate whether Christian worshippers, architects and patrons were as conscious of some of the striking architectural effects achieved in the temple conversions as we are. It is difficult to imagine that such ingenious solutions as those of Didyma and Aphrodisias were not the result of a conscious attempt to create brilliant architectural images and strong contrasts between old and new. Perhaps it is somewhat safer to conjecture that in each case there was a conscious effort to demonstrate the victory over paganism by Christianity by the juxtaposition of forms which were Classical and those which were Christian. Probably no Christian worshipper in the fifth, sixth and seventh centuries could have experienced the interior of a temple converted into a church without a feeling of deep satisfaction: the pagan cult statue had been removed, abhorrent practices had been discontinued, and the pagan site had been sanctified by its conversion into a church.

2.

The transformation of a Christian basilica into a domed church represents a variant of retrofit architecture even though the buildings were not converted to a new use. Those examples which seem to me to be of particular interest include the Lower City Church in Amorium, the domed phase of the church of the Virgin in Ephesus and the church of St Nicholas at Demre (Myra).

10 RETROFIT - HALLMARK OF BYZANTINE ARCHITECTURE?

Although the preserved walls of the Lower City Church at Amorium stand only up to approximately two meters, it is apparent that the initial building was a well constructed aisled basilica with a single apse, synthronon, chancel barrier, solea and rich opus sectile floor. The basilica has tentatively been assigned to the reign of Zeno (474-91). [18]

Probably after the destruction of the basilica, thick walls and piers were constructed over the stylobates of the colonnades and in the aisles (Figs 10-11). They were clearly designed to support barrel vaults laid out in the form of a cross, which carried pendentives and a central dome with a span of about 8 m. Each side aisle was divided into three almost equal parts including two semi-enclosed compartments at the east and west ends which flanked the central cross arms. The semi-enclosed chambers were reached from the nave and cross arms by large openings and could have been covered by barrel vaults, groined vaults or elliptical pendentive domes. The synthronon and all exterior walls of the original basilica were retained, at least in the extant lower portions of the church. The reconstruction has tentatively been attributed to the period following the destruction of Amorium by the Arabs in 838. The general appearance of the vaulted church may be reflected in the approximately contemporary, much better preserved and probably rather similar church at Vize which is now the Süleyman Paşa Camii. [19]

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18. Particularly C.S. Lightfoot, E.A. Ivison *et al.*, 'Amorium Excavations 1994, the Seventh Preliminary Report', *Anatolian Studies,* 45 (1995) 107-138; also R.M. Harrison, 'Amorium 1991', *XIV. Kazı Sonuçları Toplantısı,* 2 (Ankara, 1992) 248-9; C.S. Lightfoot, '1992 Yılı Amorium kazısı (Hisarköy, Emirdağ, Afyon)', *XV. Kazı Sonuçları Toplantısı,* 1 (Ankara, 1993) 504-5; *idem,* 'Amorium kazısı 1993', *XVI. Kazı Sonuçları Toplantısı,* 2 (Ankara, 1994) 132-4; *idem,* 'Amorium kazısı 1994', *XVII. Kazı Sonuçları Toplantısı,* 2 (Ankara, 1996) 362-3; *idem,* '1995 Yılı Amorium kazısı', *XVIII. Kazı Sonuçları Toplantısı,* 2 (Ankara, 1996), 432-46, including a floor plan; *idem,* Y. Mergen, '1996 Yılı Amorium kazısı', *XIX. Kazı Sonuçları Toplantısı,* 2 (Ankara, 1998) 346-9, including a current site plan. For the history of the site K. Belke, 'Amorion', *Galatien und Lykaonien. Tabula Imperii Byzantini,* 4 (Vienna, 1984) 122-5, and A.P. Kazhdan, ed. in Chief, *Oxford Dictionary of Byzantium,* 1 (Oxford and New York, 1991) 79-80 with somewhat different datings for Arab conquests in the seventh and tenth centuries and for the establishment of the city as a metropolis in the eighth century or the ninth, perhaps before 860. Amorium apparently became the capital of the Anatolikon theme in the seventh century. The Arab conquest of 838 was of brief duration. I am greatful to Chris Lightfoot and Eric Ivison for generously sharing their time and their thoughts about the church with me on the site.

19. I am greatful to Eric Ivison for drawing my attention to this comparison. The church in Vize is similar in size to Amorium; while the major vaulting solution was probably also similar, the aisles, corner spaces and supports at ground level differ. There appears to be no archaeological evidence to suggest that the church at Amorium had a gallery like that of Vize. For the church at Vize, F. Dirimtekin, 'Church of St. Sophia (Süleyman Paşa) at Vize' (Turkish with Engl. summary), *Ayasofya Müzesi Yıllığı,* 3 (1961) 18-49; C. Mango, 'The Byzantine Church at Vize (Bizye) in Thrace and St. Mary the Younger', *Recueil des travaux de l'Institut d'Etudes byzantines,* 11 (Belgrade, 1968) 9-13 with references to earlier publications, history and background information; S. Eyice, 'Trakya'da bizans devrine ait eserler', *Belleten,* 33 (1969) 325-58 (Turkish with French summary) with floor plans at ground and gallery levels.

The new walls and piers constitute an independent structure which was set into the shell of the earlier building. They supported all of the major vaults of the reconstructed church. The earlier exterior walls supported only about half of the minor, much smaller vaults which covered the new corner bays.

The church of St Nicholas at Demre provides a variant of the same approach to the transformation of an aisled basilica. [20] The earliest church which is now discernable was a basilica with piers and thick walls, rather than columns separating the nave from the side aisles (Fig.12). The unusual support system suggests that the basilica was probably covered by barrel vaults over the side aisles and, perhaps, with groined vaults or pendentive domes separated by barrel vaults over the nave. U. Peschlow's reconstruction of the basilica proposes a square bay in front of the bema, perhaps suggesting a dome, but other reconstructions with rectangular bays in the same location are also reasonable. [21]

Probably after the destruction of the basilica, as at Amorium, the church was entirely reconstructed with a single dome, spanning about 7 m, near its center. Parts of the north aisle, of the apse and of the southeast bay of the basilica were apparently integrated into the new building. The aisles of the new church, which were located over the aisles of the earlier building, were divided into three units: a large central unit flanked by two smaller semi-enclosed compartments. While the central units were covered by barrel vaults parallel with the nave, the corner compartments were vaulted with domes on pendentives or pendentive domes. The most conspicuous difference to the solution at Amorium is that at Demre the lateral arches supporting the central dome were narrow and did not extend over the aisles (Figs 13-16). [22]

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20. U. Peschlow, 'Die Architektur der Nikolauskirche in Myra', in *Myra*, J. Borchhardt, ed. (Berlin, Tübingen, 1975) 303-59; *idem*, 'Materialien zur Kirche des H. Nikolaus in Myra im Mittelalter', *Istanbuler Mitteilungen*, 40 (1990) 207-58 for additional evidence on chronology and history.

21. Peschlow, 'Die Architektur der Nikolauskirche', 314-5 for the evidence, fig. 41 for a reconstructed plan of the basilica, 324 for a reconstruction with barrel vaults over the side aisles and a wood roof over the nave, 341-2 for a date in the sixth century, comparable examples and further discussion. The thick wall sections flanking the nave appear to have no purpose if the nave was not vaulted, and the basilica nave had the same span, supported by walls of about the same thickness as the later domed church, suggesting that a reconstruction with a vaulted nave is reasonable. As P. points out, there is no archaeological evidence for the reconstruction of the basilica nave with a square major east bay. That bay could have had the same rectangular proportions as the major west bay; the narrow bays before the apse would then have been slightly wider. Peschlow does not suggest a dome over the square bay in his reconstruction.

22. Peschlow, 'Die Architektur der Nikolauskirche', 305-17 for a description of the present state, 324-9 for a reconstruction, 342-5 for a date in the eighth century. P.'s term 'iconoclast church' is misleading because iconoclasm did not end until 843 and probably had no direct impact on architecture. The narrow lateral arches supporting the major dome are similar to the solution of Kasr Ibn Wardan of 564 (and of St Sophia in Constantinople) and not to that of the Koimesis in Iznik. I am therefore inclined to date the domed church at Demre earlier, perhaps to the seventh century before the Arab incursions (see Foss, note 23 below) or even to the late sixth century. As P. points out, the design of the domed church may have been controlled in some respects by the preexisting building. But as far as we can tell, the major lateral arches

Again as at Amorium, in Demre the new walls constitute an independent structure which supported all of the vaults of the new church, with the minor exceptions of the southeast and northwest bays, which were apparently remnants of the earlier basilica. In contrast to Amorium, however, at Demre the transformed church occupied only the eastern part of the original basilica. It was constructed with a new narthex and a new west façade.

The Church of the Virgin at Ephesus was also transformed from an aisled basilica into a church with a central dome probably after the destruction of the original building. Large piers, rather than walls were constructed over the earlier stylobates, projecting slightly into the nave and more substantially into the side aisles. The new piers constituted an independent support system for a central dome on pendentives, for barrel vaults over the nave and for major flanking arches. The exterior walls of the original basilica remained standing at least to the height of the extant ruins, setting the northern, southern and western limits of the reconstructed building. Even though it is difficult to imagine how the church would have been articulated in detail on the interior, with its dome spanning 12 m it must have been impressive (Figs 17-19). [23]

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could have been constructed as wide as the side aisles without being encumbered by preexisting structures; their spans would have been the same as those of the existing arches east and west of the dome and, with slight changes, they could have been supported by walls with the same thickness as those supporting the east and west arches.

23. F. Knoll, *Die Marienkirche in Ephesos. Forschungen in Ephesos,* 4-1 (Vienna, 1932) 27-62 for the excavation report and basic information; F. Fasolo 'La Basilica del Concilio di Efeso', *Palladio,* n.s. 5-6 (1956) 1-22 for a useful account of the changes with explanatory floor plans and a comprehensive approach to the structural solution, including comparable examples in Asia Minor. Neither the original basilica nor the cross domed reconstruction are reliably dated. C. Foss, *Ephesus after Antiquity: a Late Antique, Byzantine and Turkish City* (Cambridge, 1979) 52-3, 112 for a summary of the building history, bibliography, and dating attributions; F.W. Deichmann, 'Zur spätantiken Bauplastik von Ephesus', *Mansel'e Armağan (Mélanges Mansel), Türk Tarih Kurumu Basımevi* (Ankara, 1974) 549-70, particularly 551, n. 4 for a carefully considered early 4th century date for the basilica; S. Karwiese, *Gross ist die Artemis von Ephesos, Die Geschichte einer der grossen Städte der Antike* (Vienna, 1995) 127-31 for earthquakes in 359-66 suggesting major reconstruction thereafter, and 140-2 for evidence of seventh-century Arab destruction which could have required the reconstruction of the church; *idem,* 'The Church of Mary and the Temple of Hadrian', *Ephesus - Metropolis of Asia: an Interdisciplinary Approach to its Archaeology, Religion and Culture,* H. Koester, ed. (Cambridge MA, 1995) 311-20 proposes a date for the basilica not before 500, and states that the lateral walls were erected as part of the south stoa of the Olympeion, which may have been constructed under Hadrian and was apparently destroyed ca. 400; K.'s attribution does not take the arguments presented by Deichmann into account, but would make the complex apsidal solution more understandable; in H. Buchwald, *The Church of the Archangels in Sige near Mudania* (Vienna, Cologne, Graz, 1969) 36-62 I proposed a date in the late sixth century or the seventh for the domed reconstruction based upon stylistic criteria some of which must be revised; M. Restle, 'Ephesos', *Reallexikon zur byzantinischen Kunst* 2, M. Restle, K. Wessel, ed. (Stuttgart, 1967) 174-7 dates the domed reconstruction about 700 or slightly later based upon similarities to St Sophia in Thessalonike which, however, has recently been attributed to the late sixth century or the seventh.

The most significant differences between the transformations in the church at Ephesus and those of the other churches are: 1. Only the western part of the basilican nave was reconstructed; 2. A new apse with small flanking chambers was added; 3. There were no semi-enclosed corner bays at the east and west ends of the side aisles, but rather, arched passages between the aisles and nave. 4. The side aisles, covered with barrel vaults, continued without interruption from the narthex to the east end of the reconstructed church.

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Our three examples demonstrate that the transformation of a basilica into a fully vaulted church with a large central dome was not an occasional, isolated phenomenon: it was a method used in the reconstruction of a number of important churches in Asia Minor. Comparable examples are unknown to me in Greece and, more important, in Constantinople, an observation to which we shall return below.

Spatially the transformed churches were more complex and more monumental than their basilican predecessors. The simple, uninterrupted basilican nave and aisles were now boldly articulated by the new walls, piers and chambers in the former aisles and by the vaulting. Most significantly the focus of the church, which had been determined by steady horizontal rhythms leading to the sanctuary shifted to the large dome above the center of the nave.

Each of the churches is a ruin or has been radically changed by later restorations. Nevertheless, it is apparent that in the transformed churches the original basilicas were almost unrecognizable. The colonnades disappeared, the floor plans were transformed, the forms and proportions of the churches were changed drastically on the interior and exterior. With their large domes their appearance differed decidedly from that of the earlier basilicas. Nowhere in the church transformations can we observe the dramatic display of earlier features such as the Classical colonnades inside the converted temple of Aprodisias. In the reconstructed churches there was no reason to demonstrate the preeminence of new over old. The conclusion could be drawn that preserved features of the earlier buildings were integrated for utilitarian reasons, to save time, effort and material.

While that explanation may well be correct, it does not exclude other possibilities. As we have seen, at Amorium the apse and synthronon of the earlier building were preserved, in Demre the southeast and northwest corner bays were integrated into the new solution, and in each reconstruction the original nave was retained, albeit in Ephesus and Demre with a reduced length. More important, in each reconstruction the preexisting flanking walls defined the limits of the domed building. At Ephesus and Amorium the original basilica façades, at least in their

lower, preserved portions, appear to have served the same purpose in the transformed churches. In Ephesus the preexisting atrium, including components of an earlier Roman building complex, and an earlier baptistery seem to have provided the setting for the reconstructed church. These observations imply that when preserving parts of the earlier buildings there was a conscious effort to emphasize continuity between the reconstructed churches and their predecessors. One reason for reconstructing these churches within the ruined buildings, rather than constructing completely new churches nearby was surely to underscore the fact that in spite of the transformations each of the buildings was still the 'same' church, probably with the same dedication, serving the same purpose and the same community.

In the conversions of temples to churches the Ancient forms were set in contrast to the new forms, emphasizing the break between paganism and Christianity. In the transformation of basilicas into domed churches, on the other hand, one major goal appears to have been the demonstration of continuity.

The floor plans of the reconstructed churches differed from those of their predecessors primarily in that the basilican aisles and colonnades were replaced by solid piers and walls which were only occasionally pierced by arched openings. In the transformed churches at Amorium and Demre these walls formed semi-enclosed corner bays located at the eastern and western ends of the former side aisles. What was the purpose of the new corner bays in the reconstructed churches?

At Amorium the western bays were open on three sides and do not seem to have fulfilled a special function. The eastern bays could, possibly, have been used as pastophories, but that solution is unlikely because the original doors in the east ends of the aisles apparently remained unblocked, and all four corner bays had wide openings to the nave, rather than doorways, giving their occupants good views of the ceremonies. [24] The two walls closest to the major dome in each of the corner bays directly supported the barrel vaults over the nave and cross arms, and seem to have been constructed only for that purpose. At Demre, the southeast bay was probably a remnant of the original church and could have been a separate tomb or chapel. The northeast unit possibly had a similar origin, but archaeological evidence is lacking. [25] The two western corner bays in Demre have doors or passages on all four sides and thick walls blocking them from the nave, making them unusable except for circulation. In the corner bays at Demre the two walls closest to the major dome would have counteracted the thrusts of the vaults which supported the dome; the preexisting walls of the southeast unit

24. The interpretation that the eastern corner bays in Amorium were not pastophories is supported by the observation that the north and south openings in the original *templon* were blocked in the reconstruction phase; see Lightfoot, Ivison *et al.*, 'Amorium Excavations 1994', 109-11, 116-8.

25. Peschlow, 'Die Architektur der Nikolauskirche', 310-5 for detailed descriptions of the corner bays.

seem to have been strengthened with that purpose in mind. All of the new corner bays of the reconstructed churches at Amorium and Demre were, therefore, apparently created primarily for structural reasons.

The vaulted solutions of Ephesus and Amorium were better able to resist damage by fire than their wood roofed predecessors, but the basilica in Demre appears already to have been vaulted. If, in the reconstructions, fire resistance was the primary concern then the vaulted basilica of Demre could have been retained or rebuilt in its earlier form, and the churches at Amorium and Ephesus could have been vaulted in a manner similar to that originally used in Demre. To obtain better resistance to fire a dome was unnecessary and could have been counterproductive. [26] Fire resistance was therefore an unlikely reason for the considerable effort required to construct these churches with large domes over the centers of their naves.

The desire to create buildings more resistant to earthquakes is an equally unlikely reason for the forms of the reconstructions. A low, light weight wood roof, such as that used over the original basilicas at Amorium and Ephesus, is better able to withstand earthquake shocks and tremors, and is easier to rebuild if it is damaged, than a taller, fully vaulted, domed construction. [27]

While the size of the transformed church in Amorium remained the same as that of its predecessor, both in Demre and Ephesus the length of the original basilica was shortened. These reductions cannot be explained by reduced means available for construction. After all, the new vaulted solutions were more ambitious than their predecessors, requiring more material and greater skill to construct.

Demographic changes are also unconvincing as the reason for the reductions in the church lengths. Standing tightly compressed one person requires approximately 0.60 x 0.60 m, or 0.36 sq m; standing only somewhat more comfortably 0.70 x 0.70 m are required, or about 0.5 sq m. Assuming, for the moment, that about 10% of the floor area was not accessible to the congregation, at ground level the basilica at Ephesus would have contained between approximately 3500 and 4900 persons. In Demre, assuming the west end of the original basilica was near the west end of the present west courtyard, the capacity would have been between about 1280 and 1780. Both churches attracted pilgrims and were used by worshippers from the surrounding regions, and probably both

26. If the windows in the dome were open or broken the dome, particularly if it was constructed on a drum, would have created a flue effect like that of a chimney.

27. V. Ruggieri, *Byzantine Religious Architecture (582-867): its History and Structural Elements. Orientalia Christiana Analecta,* 237 (Rome, 1991) 141-53; *idem, L'architettura religiosa nell'Impero Bizantino (fine VI-IX secolo)* (Accademia Angelica Costantiniana di Lettere Arti e Scienze, *Saggi Studi Testi 2*; Messina, 1995) 41-51, for a different interpretation of the evidence concerning earthquake resistance; see also the reviews by H. Buchwald, *Jahrbuch der Österreichischen Byzantinistik,* 43 (1993) 469-73 and *idem, Jahrbuch der Österreichischen Byzantinistik,* 48 (1998) 395-7 for more detailed discussions of the issues.

could have been filled in their original sizes even after the late antique period in spite of the fact that the population decreased. [28]

The reductions of the church lengths at Ephesus and Demre therefore should not be explained by economic or demographic reasons. Rather, they were probably caused by the desire to focus attention upon the central domes. If the naves had been as long as those of the original basilicas, then the domes would have been out of proportion with the nave lengths, and insignificant in appearance. With the shorter naves, the domes clearly dominated the interior spaces. At Amorium a reduction of the nave length was unnecessary because the original church nave was already well proportioned for focusing attention upon the dome. Here the proportion of nave width to length was 1:3, at Ephesus it was originally 1:6 and at Demre apparently 1:4.

Based upon the observations outlined above we may draw the conclusion that in the transformations of the churches at Amorium, Demre and Ephesus most of the changes to the original basilicas served the purpose of providing a large, prominent, well integrated dome over the center of the nave. Why was that solution preferred? One possible answer involves the symbolism of the 'dome of heaven'. [29] However, it is uncertain when the symbolic meaning of the dome may have been generally accepted. In medieval Byzantine architecture that symbolism appears to be echoed by the depiction in domes of subjects which were thought to be in heaven, such as the Pantocrator. [30] But the standard medieval monumental painting programs were developed after iconoclasm. The church reconstructions in Demre and Ephesus, on the other hand, should be dated to the period before the end of iconoclasm, and Amorium not much later. [31] Therefore

28. The reduction of the nave length at Ephesus was about 37%, while in Demre it was slightly over 50%, but in each example the area of the church floor was reduced even more by the thick walls and large piers. Both churches could have been reconstructed with domes before the Arab destructions in the seventh century. See particularly Foss, *Ephesus after Antiquity,* 103-37 for medieval Ephesus, which was the most important city in western Asia Minor at the time; for late antique and medieval Myra and the surrounding region, *idem,* 'Cities and Villages of Lycia in the Life of Saint Nicholas of Holy Zion', *Greek Orthodox Theological Review,* 36 (1991) 303-39, particularly 313-18; *idem,* 'Lycia in History', *The Fort at Dereağzi,* J. Morganstern ed. (Tübingen, 1993) 19-32, particularly 28; *idem,* 'The Lycian Coast in the Byzantine Age', *Dumbarton Oaks Papers,* 48 (1994) 1-52, particularly 23-37.

29. K.E. McVey, 'The Domed Church as Microcosm: Literary Roots of an Architectural Symbol', *Dumbarton Oaks Papers,* 37 (1983) 91-121 for references to earlier studies and for an investigation of a sixth-century Syrian text which could, but need not necessarily be relevant to other locations; also T.F. Matthews, 'Cracks in Lehmann's Dome of Heaven', *Source: Notes in the History of Art,*1-3 (Spring 1982) 12-16.

30. O. Demus, *Byzantine Mosaic Decoration.* (London 1948), particularly 10-39.

31. None of the churches is firmly dated. See note 18 for the tentative ninth-century date of Amorium, which could have been constructed immediately before the end of iconoclasm; note 22 for the date of Demre, attributed to the eighth century by Peschlow and to the late sixth or seventh by Buchwald; note 23 for the dating attributions of Ephesus, usually between the late sixth century and the eighth.

the symbolism of the dome could, but need not have been a decisive factor for the transformations of these three churches.

Even if the symbolic meaning of the dome was an incentive for the forms of the reconstructions, another consideration may also have been relevant. After the reconstructions the most prominent and most striking characteristic of St Sophia in Constantinople, the large dome over the center of its nave, also became the most striking feature of each of the reconstructed churches. To be sure, many secondary features of St Sophia, such as the lower exedras, were not imitated. But one motivation for the central domes of the reconstructed churches could have been to make them similar to St Sophia.[32] The parallel between Ephesus, the most important city of western Asia Minor in the late antique and early medieval periods, [33] and Constantinople was underscored by the fact that its two major churches, St John's and the church of the Virgin, were similar to the Holy Apostles and to St Sophia. After all, Justinian's St Sophia was also the reconstruction of a basilica, even though none of the features of the earlier church were integrated into the new building. In all three church transformations the importance of the reconstructed churches may have been emphasized by making them similar to St Sophia in Constantinople. At Ephesus and Demre the similarity to the basilican aspect of the St Sophia nave was echoed by the tribelons flanking the nave; similar tribelons could have existed at Amorium even though there appears to be no direct evidence for them.

3.

Of the numerous Byzantine churches which were reconstructed and transformed in the medieval period we will be concerned with only one unusual and outstanding example, the Parēgorētissa at Arta.

The first phase of the church of the Virgin Parēgorētissa is attributed stylistically and historically to about the middle of the thirteenth century or to the decade following 1250. Although its outer walls can be traced to the height of 5-8 m its original interior form is uncertain. It could have had an inscribed cross plan or a rectangular floor plan with an octagonal superstructure, in either case with flanking porches. Probably after its partial destruction the first phase was reconstructed in the early 1290s, before 1296, according to a stylistic analysis and a donor inscription. The reconstruction was skilfully designed and executed

32. For additional discussion of the impact of St Sophia on the design of other churches, R.J. Mainstone, *Hagia Sophia* (New York, 1988) 237-48; H. Buchwald, 'Saint Sophia, Turning Point in the Development of Byzantine Architecture?', *Die Hagia Sophia in Istanbul. Akten des Berner Kolloquiums vom 21. Oktober 1994, Neue Berner Schriften zur Kunst 3*, V. Hoffmann, ed. (Bern, 1998) 29-58, particularly 41-6 [I in this volume].

33. See above, n. 28.

and included interior marble sheathing and mosaics (Figs 20-23).[34]

The central dome of the reconstructed church, which spans roughly 5 m, is supported by four slightly pointed arches and four pendentives[35]. The bottom of each pendentive is divided into two parts by a niche, framed by small decorative columns, which rests on two larger columns. These supporting columns are carried by beams composed, for the most part, of reused columns cantilevered out from wall piers. The cantilevered beams are also partially supported by columns which stand on recesses in the wall piers. The verticality of the columns in three stories, one above the other, and the steep interior proportions provide an overwhelming shaft-like impression which is unique in Byzantine architecture. Large ancillary spaces were constructed on three sides of the central core in two stories at the same time, integrating the porches of phase I at ground level.

On the exterior, in startling contrast to the verticality of the core the Parēgorētissa has a harmonic, relatively horizontal, box-like appearance which, as has often been noted, is more reminiscent of Italian palaces than of Byzantine churches. The central and four corner domes, as well as an open round pavillion on the roof add to the architectural richness. Architectural stone carving which is south Italian in character is used on the interior and exterior. The architect combined elements of Byzantine, Gothic and south Italian architecture.[36] The construction crew, however, was local because the façades are richly ornamented by brick patterns typical of buildings in the Epirote region at the time.[37]

As L. Theis observes, the forms of the Parēgorētissa reconstruction appear to have been motivated primarily by two considerations. The first is structural; the complex system of column and cantilever supports underneath the dome served the purpose of reducing the span, and the gallery construction was employed to counteract the vaulting thrusts and to stiffen the structural system. The second

34. See the very thorough study by L. Theis, *Die Architektur der Kirche der Panagia Parēgorētissa in Arta, Epirus* (Amsterdam, 1991) 19-40 for a review of earlier references and studies and 41-124 for a description and analysis of the first church.

35. *Ibid.*, 125-165. The destruction of phase I in warfare cautiously proposed by Theis 144, 156 seems unlikely because before the introduction of gunpowder weaponry for such a task was not usually available. At any rate, the wanton destruction of the dome without extensive damage to the exterior walls would have been possible only from inside the church at considerable risk to those performing the destruction. A hot fire could have damaged the masonry but there were usually only limited amounts of combustible materials in medieval Byzantine churches. As proposed and documented by Theis 142-3, it seems more likely that the dome of phase I collapsed as a result of an earthquake or because of structural inadequacies.

36. Theis, 158-161 speculates that the architect may have been a Frank from the Latin Morea and traces the close political connections, which continued into the 1290s, between the two regions. The Frankish architecture known in the Morea, however, lacks the dynamic tensions, ingenuity and high quality of the Parēgorētissa. Perhaps the architect was a Frank from France who had worked with Byzantine architecture first hand, or a Greek who was familiar with the architecture of France and southern Italy. Travel between Greece and France or southern Italy was common enough in the thirteenth century.

37. Theis, 146-49 for the façade decoration.

motivation is less tangible, and involves the use of the building as a demonstration of political interests and of power. For instance, galleries were often included in churches of Byzantine rulers, and the round pavilion on the roof could have had similar connotations. The unusually large size of the ancillary spaces, compared to that of the original church, should probably be explained as an attempt to make the building more imposing; the horizontality of the ancillary spaces also contrasted and emphasized the verticality of the core, thus making the spatial effect of the dome more dramatic. The church is located on high ground to be seen from afar. With its dramatic, unusual spatial contrasts and rich but careful detailing it is probably the most splendid, awe-inspiring building known from the late thirteenth century anywhere in the Byzantine sphere. The international references in the architecture to Byzantine, Frankish and south Italian traditions echoed the ties of the Epirote despots to their Byzantine imperial heritage and to various Western ruling houses such as the Villehardouins of the Morea and the Hohenstaufens and Angevins of southern Italy. [38]

After the changes were made, the forms of the earlier church remained visible approximately to the height of the lowest string course, as the walls of the naos, apse and flanking apsidal bays. The earlier walls were cleverly and completely integrated into the transformations and were no longer readily identifiable as those of the previous building. They were not contrasted with the new forms as, for instance, the Ancient columns were in the temple conversions. The conclusion could be drawn that portions of the earlier church were preserved in the Parēgorētissa only for utilitarian reasons, to save effort and expense. However, the earlier church was apparently commissioned by Michael II Comnenodoukas (1231-1267), the father of Nicephorus I, who commissioned the reconstruction of the 1290s. [39] Retaining as much of the earlier building as was useable would have been an obvious goal if Nicephorus reconstructed the church, at least in part, with deference to the original building commissioned by his father.

38. *Ibid.*, particularly 134-7 for the gallery and its possible use for ceremonies by the ruling house with references to earlier studies. Because the gallery floors and walls remained unfinished, and because the gallery was almost inaccessible, it is an intriguing possibility that it was constructed not for actual use by the Despot, but rather as a non-functioning symbolic gesture, a demonstration of the fact that the church was commissioned by a reigning Despot; 5-18 for the Epirote political background, 137-140 for the roof pavilion, 154-165 for the stylistic context and political issues. Also Mango, *Byzantine Architecture,* 141-8 for additional background information, illustrations and a different architectural evaluation of the building.

39. Theis, particularly 122-3, 154-5.

4.

The examples of retrofit buildings we have briefly reviewed represent a small sampling of the many Byzantine transformations of temples and churches. Other, more peripheral but still important aspects of Byzantine architecture could also be explored in terms of their retrofit character, for instance, the use of spoils as carved stone ornamentation, the common construction of entire buildings only with reused building material, and the radical changes in Ancient cities which continued to be used during the medieval period. However, the transformation of *buildings* is at the core of retrofit architecture during all periods. With the small sampling which we have outlined we can therefore draw initial conclusions concerning Byzantine retrofit architecture.

We may begin by looking more closely at the question posed in the title of this paper, 'was retrofit the hallmark of Byzantine architecture?' The prime contribution of Byzantine architecture was surely the development of numerous useful, new, important, original and exceptional building forms which were designed unencumbered by previous buildings on the same site. Among examples which come to mind are the basilican church solution, various polylobed ambulatory churches such as San Lorenzo in Milan and San Vitale in Ravenna, the unique form of St Sophia in Istanbul, the inscribed cross church type and churches with domes on octagonal substructures like Hosios Loukas and Daphni. Retrofit can, therefore, not be thought of as the hallmark of Byzantine architecture: at least the foremost Byzantine architects and patrons had a greater interest in the invention of new forms than in the transformation of earlier buildings.

Nevertheless, in a *conceptual* sense most of these new forms can also be thought of as retrofit, even though changes to existing buildings were not involved. For instance, it is commonly accepted that the Christian basilica was conceptually a retrofit civil basilica of the Roman period, and that polylobed ambulatory churches were probably conceptually retrofit domed rooms of Late Roman palaces. The unique forms of St Sophia in Istanbul could be thought of as combinations of conceptually retrofit domed basilicas and polylobed ambulatory churches. The inscribed cross church type and domed churches with octagonal substructures are, perhaps, less retrofit conceptually, and could be seen as examples of pure invention; but even here, there are clear indications of the conceptually retrofit use of earlier forms such as the aised basilica, the cruciform plan, and domes on pendentives or squinches.

Is retrofit, then, the hallmark of Byzantine architecture after all, if we consider its use conceptually, and not only in the transformation of earlier buildings? I do not think so. The forms of innumerable Romanesque, Gothic and Renaissance churches can be thought of as conceptually retrofit early Christian

basilicas; other churches of many periods in the West are conceptual retrofits of earlier churches with centralized floor plans such as San Vitale in Ravenna or the Holy Sepulchre in Jerusalem; many Baroque churches may be understood as conceptual retrofits of Renaissance churches. This broadly expanded definition of the term makes retrofit architecture so generally applicable that it becomes meaningless. Defined conceptually, retrofit is not the specific hallmark of Byzantine architecture, but of most architecture worldwide.

We should therefore limit our observations concerning retrofit architecture to the physical transformation of earlier buildings. Our brief examinations demonstrate that retrofitting buildings was enormously important in the Byzantine period. The great volume of retrofit construction, which must be counted in the hundreds, is in itself an indication of the importance of this method of obtaining suitable buildings for worship during many periods throughout the Empire. Disregarding, for the moment, the many dozens of conversions of Ancient buildings, important, clearly retrofit churches which we have not described above include St Eirene, the Kariye Camii and Kalenderhane Camii in Istanbul, the Cumanın Camii in Antalya, St Catherine in Thessalonike, the Metropolis at Mistras, St Sophia at Ohrid, the church of the Virgin Ljeviška at Prizren, St George at Staro Nagoričino, the church with four exedras at Apamea and the church of the Holy Sepulchre in Jerusalem.

Each of the examples which we have reviewed in detail, regardless of the period and the type of transformation, was important. The preeminence of the Parthenon, of the Didymaion and of the temple of Aphrodite in Antiquity need hardly be stressed. The temples of Athena in Syracuse and of Olbian Zeus in Uzuncaburç were in the centers of important provincial cities and were both transformed into cathedrals. The church of the Virgin in Ephesus was a venerable Byzantine site located in the largest city of western Asia Minor during late Antiquity and the early Middle Ages. The church in Demre was the bishop's seat of Nicholas, one of the most revered saints of the Empire. Whether or not the Lower City Church at Amorium was the cathedral, it was located in the capital of the Anatolikon theme, a bulwark against the Arab onslaughts, the major city of the region and the birthplace of Michael II (820-29), founder of the Amorian dynasty. The Parēgorētissa had a prominent location in Arta and was commissioned by the Despot as a demonstrative showpiece for his capital.

In some examples, for instance at Aphrodisias and Ephesus, the size of the transformed building must in itself have been visually impressive and must have required proficient engineering skills. A number of the transformations, for instance the examples at Didyma, Aphrodisias and Arta made strong and unusual architectural statements which stand out because of their powerful imagery and because of the ingenuity used in their design. Each of the three latter solutions makes a unique contribution which enriches the vocabulary of Byzantine architecture.

VIII

22 RETROFIT - HALLMARK OF BYZANTINE ARCHITECTURE?

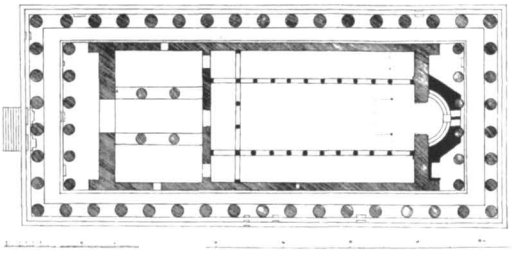
There can be no doubt that when addressing retrofit architecture during the Byzantine period we are dealing not with a marginal phenomenon, but with a 'main stream' Byzantine method of obtaining a great many useful buildings some of which were unusually important or outstanding, not only when they were erected or transformed, but also today as prime examples of Byzantine architectural development and achievement. [40]

In addition, it is apparent that our investigation has raised numerous questions. It also provided initial observations concerning what changes were made when a building was transformed, and what original elements were retained. These may provide new insights concerning how Byzantine architects and patrons approached their projects, and what characteristics of Byzantine churches were considered essential during different periods.

Illustration Sources

G. Agnello, *Guida del Duomo di Siracusa* (Syracuse, 1964), Figs 4-5; author, Figs 8, 10, 14-18; F.W. Deichmann, 'Die Basilika im Parthenon', *Athenische Mitteilungen*, 63/4 (1938-39), Fig. 1; W.B. Dinsmoor, *The Architecture of Ancient Greece*, 3rd ed., revised (London, 1950), Fig. 3; K.T. Erim, '1971 Excavations at Aphrodisias in Caria', *Türk Arkeoloji Dergisi* 20 (1973), Fig. 9; C. Foss, *Ephesus after Antiquity, a Late Antique, Byzantine and Turkish City* (Cambridge, 1979), Fig. 19; S. Hill, *The Early Churches of Cilicia and Isauria. Birmingham Byzantine and Ottoman Monographs*, 1 (Aldershot, 1996), Fig. 7; J. Keil, A. Wilhelm, *Denkmäler aus dem rauhen Kilikien. Monumenta Asiae Minoris Antiqua*, 3 (Manchester, 1931), Fig. 6; H. Knackfuss, 'Das Heiligtum nach dem Aufhören der Arbeiten am Tempelbau', *Didyma*, T. Wiegand, ed. (Berlin, 1941), Figs 2-3; F. Knoll, *Die Marienkirche in Ephesos. Forschungen in Ephesos IV-I* (Vienna, 1932), Fig. 19; C.S. Lightfoot, '1995 Yılı Amorium kazısı', XVIII. *Kazı Sonuçları Toplantısı*, 2 (Ankara, 1996), Fig. 11; C. Mango, *Architettura Byzantina* (Milan, 1978), Fig. 23; A.K. Orlandos, *E Parēgorētissa tēs Artas* (Athens, 1963), Fig. 22; U. Peschlow, 'Die Architektur der Nikolauskirche in Myra', *Myra*, J. Borchhardt, ed. (Berlin, Tübingen, 1975), Figs 12-13; L. Theis, *Die Architektur der Kirche der Panagia Parēgorētissa in Arta*, Epirus (Amsterdam, 1991), Figs 20-22;

40. It is therefore surprising that temple conversions and church transformations are treated only peripherally, if at all, in standard studies of Byzantine architecture.



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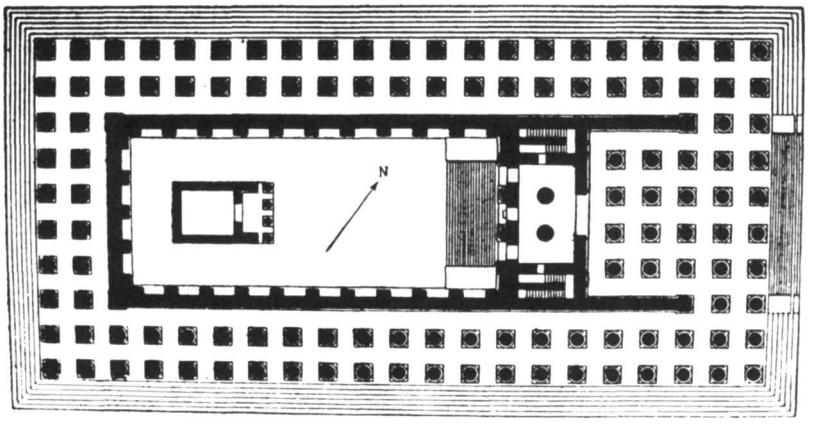

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1. *Parthenon at Athens*. Floor plan with Christian basilica reconstruction, 1:1000 (Deichmann). 2. *Temple of Apollo at Didyma*. Christian basilica, looking east (Knackfuss) 3. *Temple of Apollo* at Didyma. Floor plan, 1:1000 (Dinsmoor) with Christian basilica in the adyton (Knackfuss)

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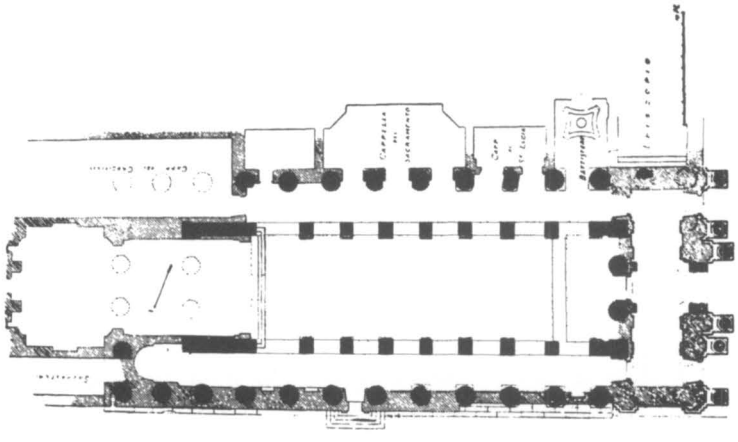

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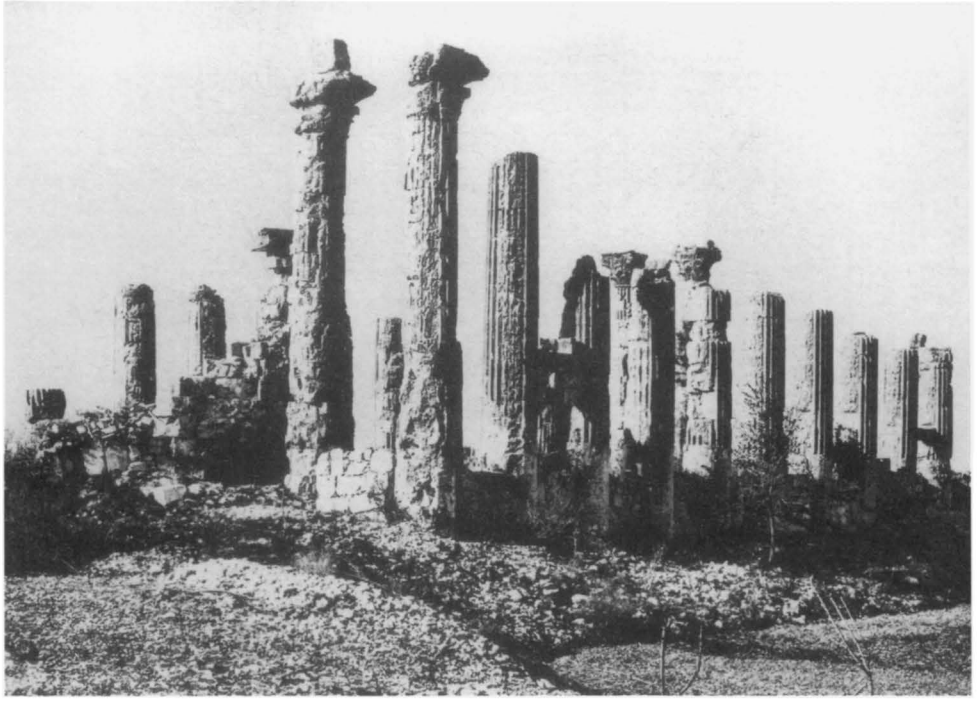
Cathedral of Syracuse, formerly Temple of Athena. 4. North facade (G. Agnello) 5. Floor plan, 1:500, showing Ancient and later portions (G. Agnello)



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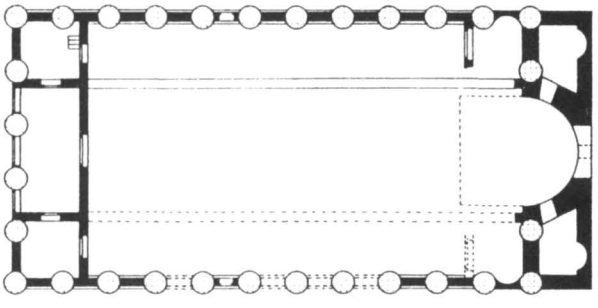

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Temple of Olbian Zeus at Uzuncaburç. 6. View looking southwest (Keil, Wilhem) 7. Floor plan, 1:500, showing Ancient and later portions (Hill)

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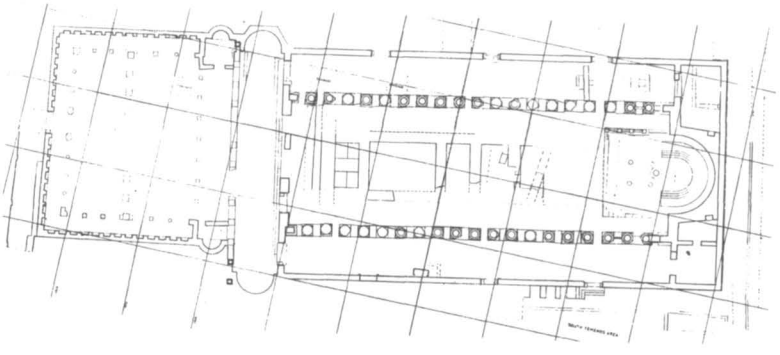

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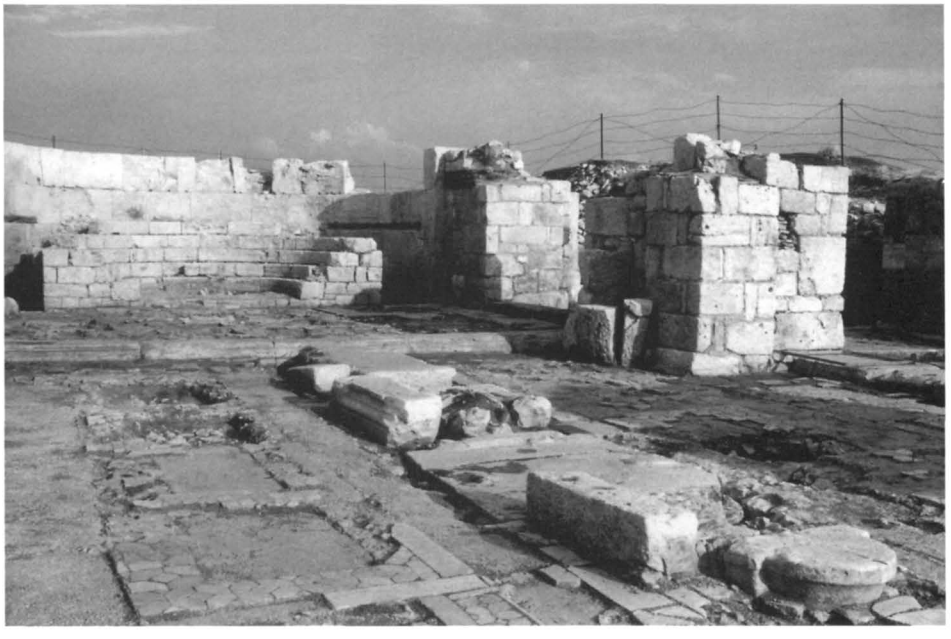
Church, formerly Temple of Aphrodite at Aphrodisias. 8. South aisle and nave looking northeast (author, 1998) 9. Floor plan, 1:750 (Erim)



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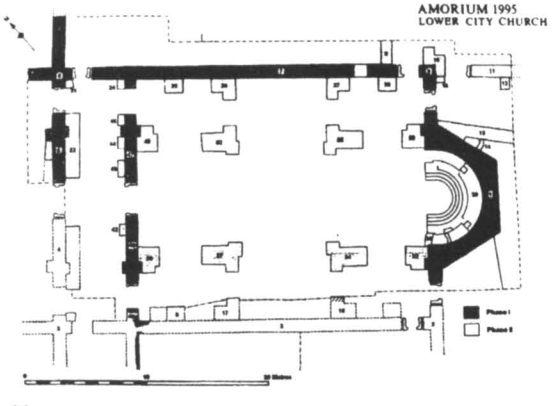

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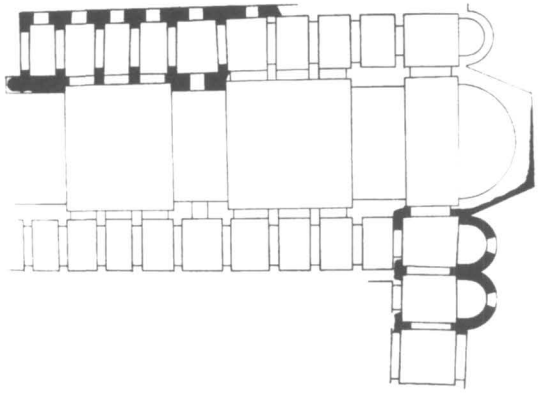
Lower City Church at Amorium. 10. Nave looking northeast (author, 1998) 11. Lower City Church at Amorium, floor plan, 1:500 (Lightfoot)



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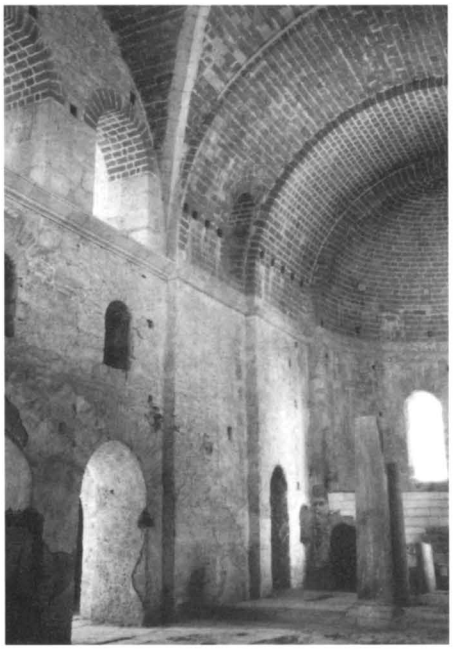
Church of St Nicholas at Demre (Myra). 12. Reconstructed floor plan, 1:500, Phase 1 (Peschlow)
13. Floor plan, 1:500, all phases (Peschlow)



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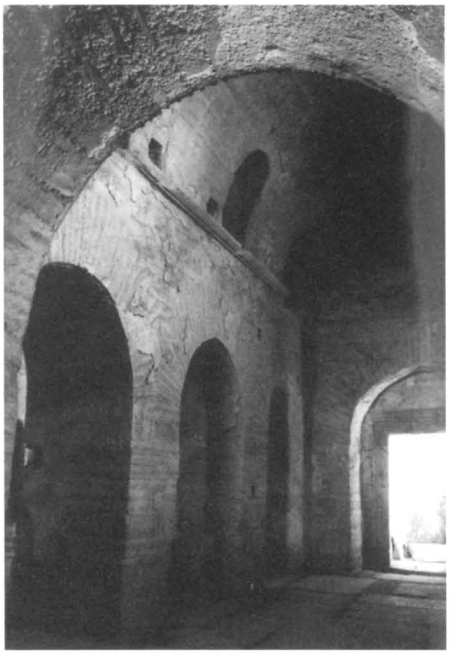

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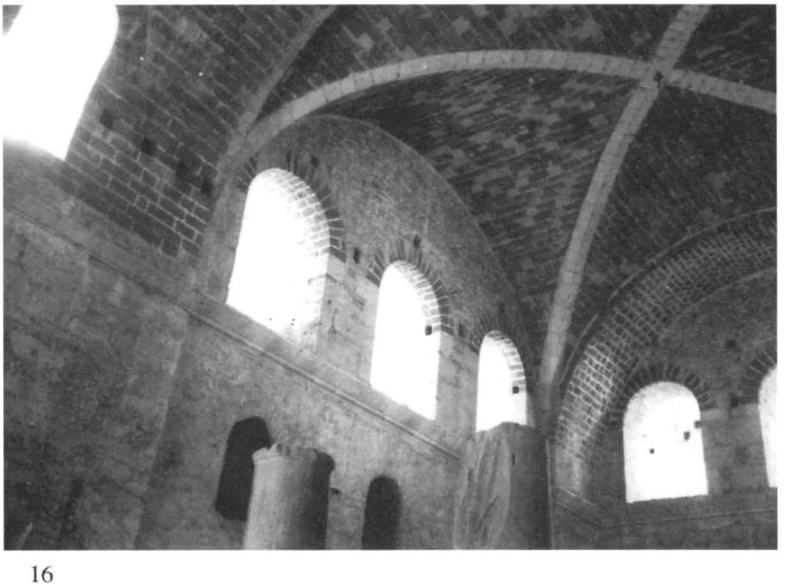

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Church of St Nicholas at Demre (Myra). 14. Nave looking northeast, vaulting reconstructed (author, 1965) 15. South aisle looking northeast (author, 1965) 16. Nave looking southwest, vaulting reconstructed (author, 1965)

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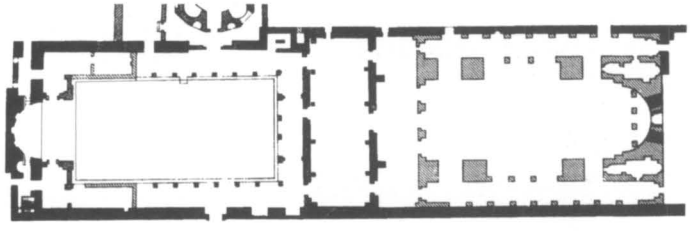
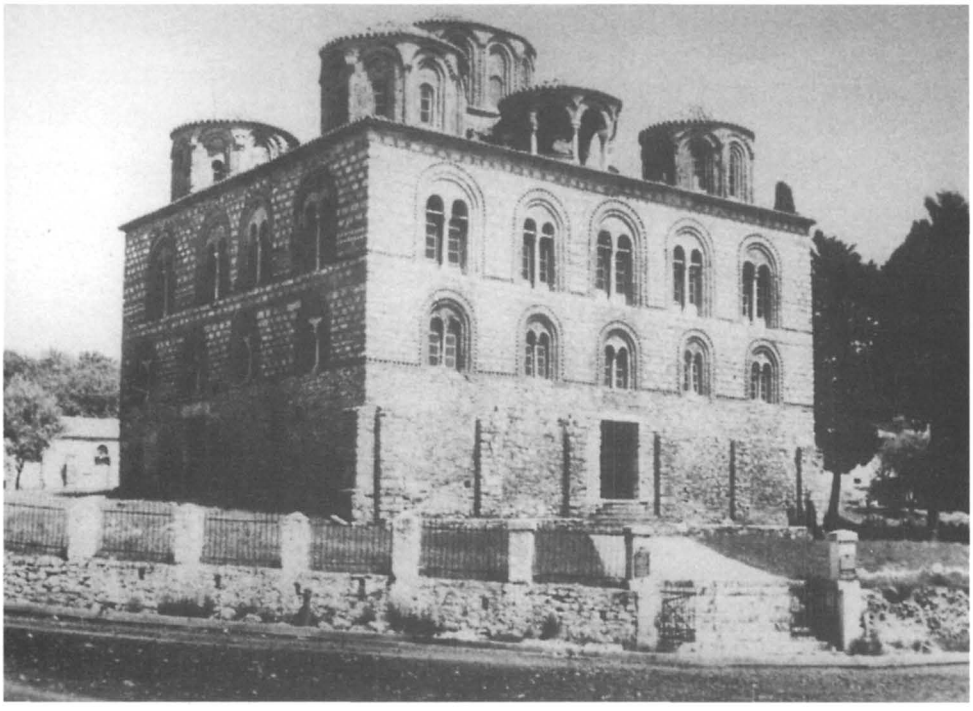


Church of the Virgin at Ephesus, domed phase. 17. Nave north side looking northeast, brickwork restored (author, 1965) 18. South aisle looking west (author, 1975) 19. Floor plan, 1:1000, including earlier atrium (Foss, Knoll)



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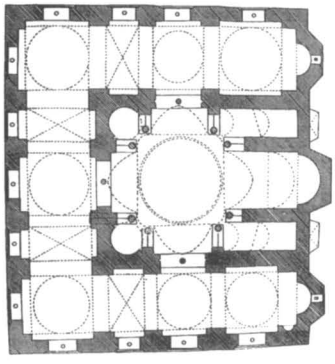

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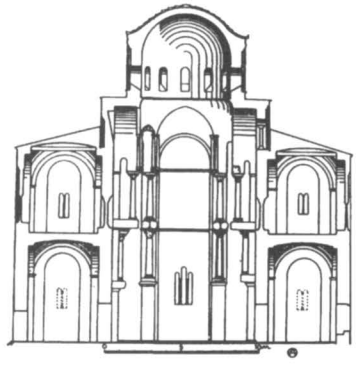

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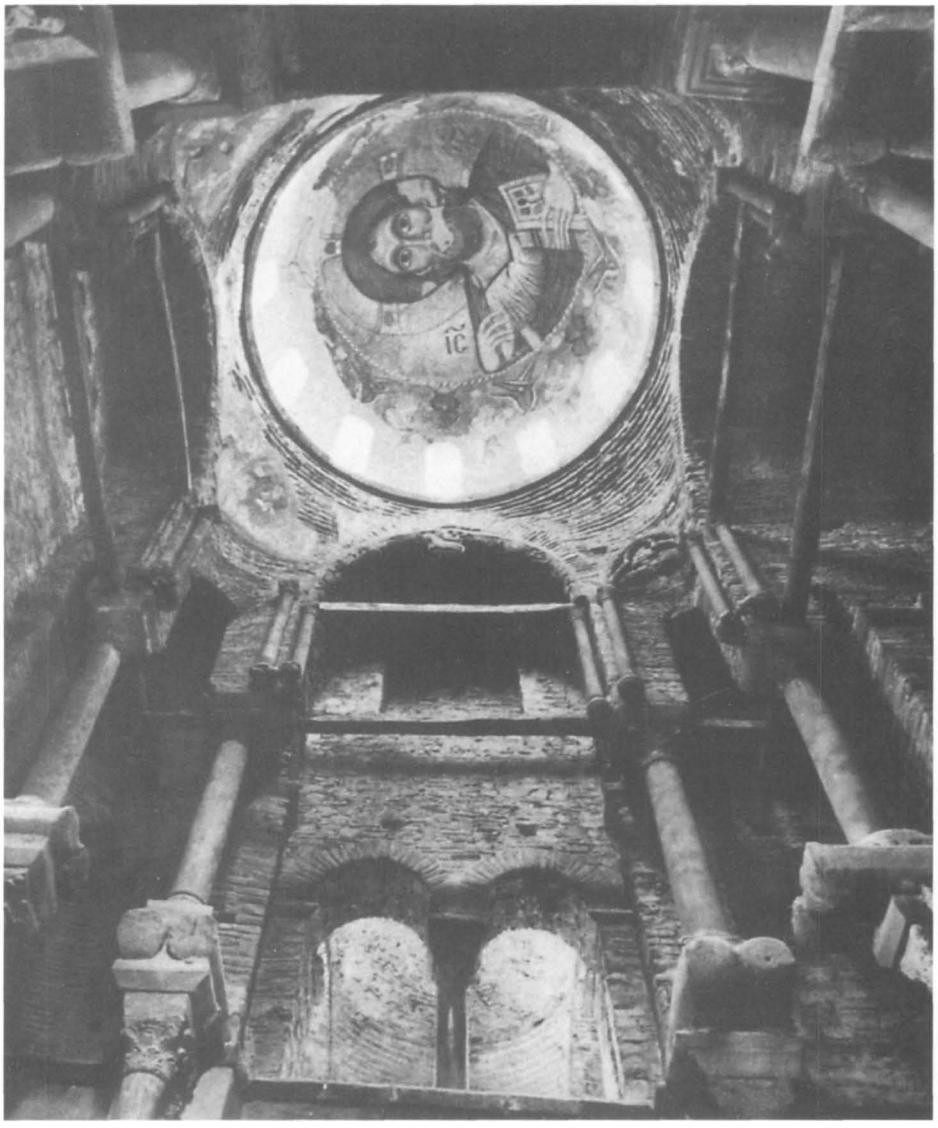
Church of the Virgin Parēgorētissa at Arta. 20. View looking southeast (Theis) 21. Gallery floor plan, 1:500 (Theis) 22. Cross section looking east, 1:500 (Orlandos)



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23. *Church of the Virgin Parēgoretissa at Arta.* Nave looking up and north (Mango)

IX

THE FIRST BYZANTINE ARCHITECTURAL STYLE: EVOLUTION OR REVOLUTION?

With six plates

Little more than the plan at ground level and a few architectural details remain of church EA in Sardis, which was probably built about the middle of the 4th century (Fig. 1-2)[1]. In the course of my work on the church I attempted to visualize the original appearance of the building and to develop an understanding of its primary stylistic characteristics in spite of its poor state of preservation. While doing so it became clear to me that, although a few sttempts to clarify the architectural style of the period were made, for the most part earlier in our century and now no longer entirely relevant[2], more recent accounts of Byzantine architecture usually concentrate either only on specific aspects of style[3], or on the origins of types, motifs and particular characteristics[4]. They therefore fail to provide criteria adequate for gaining a clear insight into the underlying stylistic principles of early Byzantine architecture.

In recent works Byzantine architecture is often classified by date, location, or building type[5]. Monuments may be grouped by the century or period in which they are thought to have been constructed or by the rulers under whom they seem to have been built. Buildings are discussed in the context of other buildings in the same place or region in which they are located, and at times are categorized according to building types such as the basilica, centralized solutions, or the inscribed cross plan.

This approach is convenient, useful, and probably necessary in a field of research which deals with such a broad expanse of territory over such an extended period of time. It is undoubtedly propagated by a sense of objectivity, seen in terms of those natural sciences which require more or less similar forms of classification. While it is not surprising to find areas of the humanities which orient themselves on the natural sciences in an era when the natural sciences have opened so many new possibilities, the kind of objectivity achieved seems to me to be illusory when applied to Byzantine architecture because it organizes the available material primarily according to secondary features and fails to emphasize essential characteristics.

One of the most essential, if by no means the only characteristic important for an understanding of the architectural production of any period is that best summarized by the term style. Only after the major stylistic attributes and developments have been identified and described will it be possible

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to achieve an adequate understanding of Byzantine architecture. The approach outlined above has failed to provide stylistic criteria which can be used to achieve this end.

It is the purpose of my paper to open a discussion concerning the stylistic criteria relevant to Byzantine architecture, and to demonstrate that such a discussion can be fruitful in obtaining broader scope and understanding not only of those buildings immediately concerned, but also of Byzantine civilisation in general. I will attempt to gain insight into the style of Byzantine architecture by concentrating, initially, upon the phenomenon I would like to consider as the First Byzantine Architectural Style.

I consider Byzantine architecture to begin with the rise of Constantine to power early in the 4th century, an unorthodox definition which may seem arbitrary, but which is less arbitrary than other definitions and has the virtues of simplicity and clarity. Byzantine history is usually considered to begin with the reign of Constantine, and, far more important, such a definition emphasizes the unbroken continuity, in spite of the many well known changes, in the Byzantine architectural development.

I consider style to deal above all with the organization of architectural space, secondly with the articulation of interior and exterior surfaces, and finally with the formulation of architectural details and decoration. It is clear that these aspects may be isolated from each other only in a theoretical analysis, and never in an actual architectural example. I wish to emphasize that style cannot be adequately described by referring to similarities in floor plans, a point which was demonstrated with remarkable insight by Friedrich Schinkel well over a century ago when he designed, alternatively, a church in the Gothic idiom and one in the Classical idiom on the same floor plan. The most important features of the inscribed cross floor plan can be found in churches built in the Byzantine, Romanesque, Renaissance, and Baroque styles as well as in Ottoman mosques. Equally important is the observation that a description of a building, no matter how accurate and how detailed must also be rejected as an analysis of architectural style, even though it may serve as an excellent point of departure for such an analysis.

The most prominent building type of the First Byzantine architectural style is the aisled basilica. It is therefore appropriate to analyze the style in terms of its appearance in this building form and then trace it in other building types. Because we are concerned with the First Byzantine architectural style we must begin our analysis with buildings erected at the beginning of the Byzantine period, and then trace the style in subsequent decades and centuries in an attempt to circumscribe the period during which it prevailed. Because we are dealing with an age of centralized imperial power it is of equal importance that we focus the analysis upon monuments which emanate from the center of power, initially imperial

Rome, so that we first clarify the main stream of production; subsequently we can explore other stylistic currents elsewhere.

The most prominent spacial attribute of a Constantinian aisled basilica is the use of clear, simple, easily defined, unambiguous spacial units which may be described in terms of basic Euclidean geometry (Fig. 4).[6] Each unit, the nave, the aisles, the transept and narthex if they existed, and the apse or equivalent element opposite the entrance is a discreet, separate, unequivocal geometric form which is experienced as a single spacial element. The purely abstract geometric quality of each space is usually underscored by the total lack of secondary articulating features.

The major spacial units of the basilica are related to each other in an <u>additive</u> manner according to an underlying principle of <u>interdependence</u>. Each unit is a clear, distinctive geometric element placed along side the other elements. None of the units can exist alone except as a fragment, each unit presupposes the existence of each adjacent unit. The nave, the aisles, the transept, the apse are so related to each other that if one unit were removed the adjacent units would no longer be coherent within the architectural system. This observation holds whether or not there was a transept, narthex, or even side aisles.

At the same time each spacial unit fits neatly and clearly into an easily comprehended <u>hierarchical</u> system which is closely related to the principle of <u>bi-lateral symmetry</u>. The aisles are subordinate to the nave due to their lesser size, lower height, and more peripheral locations with respect to the major axis of symmetry. The transept, if there was one, dominates because of its location at the far end of the nave from the entrance, and because of its direction at right angles to the major axis of symmetry. The apse is the most dominant feature of the building due to its location at the end of the major axis of symmetry and because its circular forms stand in stark contrast to the rectilinearity of all other spacial units.

The wall is usually flat and is seen as a single uninterrupted surface which defines the limits of the volumetric interior space in terms of the two-dimensional Euclidean plane (Fig. 6-8). Nowhere is the plasticity, the mass, or the structural coherence of the wall permitted to disform its geometric integrity.[7] The lack of structural or other plastic articulation creates a taut surface tension in the face of the wall which belies materiality and places the pure geometry of architectural space into the realm of precisely defined but visually incorporeal form.

Only the windows and colonnades give an inkling of the mass of the wall (Fig. 6-8). However, the windows are also conceived as simple, geometric elements which are cut out of the wall plane, usually without a trace of plastic articulation. The window is therefore read as the absence of wall, rather than as an individual architectural feature, leaving the surface of the wall appear to be

an integral plane which continues without interruption around the puncture of the openings. The large size and great number of the clerestory windows make the walls and the architectural volumes appear to be even lighter and airier, more weightless, and therefore even less corporeal.

By raising the walls of the nave, and partially also of the aisles and transept on a series of stilt-like supports the appearance of lightness, weightlessness, and incorporeality is heightened and emphasized (Fig. 4-6). The pronounced architrave above the capitals of the colonnades in the nave produces a clear and strong division between the light, airy, almost ethereal upper zone and the somewhat darker lower portion of the space. While the architrave visually and literally underscores the simple rectilinear geometry of the nave, where an archivolt is used instead of an architrave there is a stronger integration of the column with the wall it carries; the column can be understood as a reduction and continuation of the clerestory wall, which is already gradually reduced in the spandrels above the arches (Fig.4-5).

The colonnades introduce a sense of tension into the architectural composition of the aisled basilica, not only because of the pronounced contrast between the lighter and the darker zones and because the mass of the wall is raised on massless stilts, but also because the colonnades provide freedom of movement, both visually and physically, between the individual spacial units of the church which are so rigidly defined and separated in the clerestory zone. When seen in distant perspective, for instance from one end of the nave, the tight spacing of the columns creates the illusion of a closed surface, an extension of the clerestory wall down to the floor plane. When seen at an angle however, the colonnade seems to open up like an undrawn curtain, onto views of adjacent spaces. Indeed, the principle of diaphanous spaces, in which one space is seen through another space may be considered to be one of the underlying characteristics of the aisled basilica.

In a phenomenon which may be called the "lense effect" because it is comparable to seeing through the lense of a camera only fragments of each space can be experienced at the same time. Standing close to the colonnade the space in which the viewer stands is seen as fragmentary and the distant space is seen more completely. Standing farther from the colonnade the space of the viewer is seen more completely, while the distant space is seen as a fragment. Although this effect can be observed to a limited degree wherever two spaces are linked by doors or other openings, in the aisled basilica the effect is raised to an important principle of spacial experience and may be observed almost anywhere in the church building.

The architectural composition of the aisled basilica is inherently dynamic in its spacial organization. The dynamic quality is achieved above all by the long and narrow proportions of the nave and aisles, and by the location of

the major entrance at one end of the nave on the major axis of symmetry, opposite the apse or equivalent unit. The uniform unbroken rhythm of the clerestory windows, equal in size and equidistant from each other, and of the colonnades considerably enhances the dynamic quality of the space. The colonnades, placed parallel with the direction of movement are a source of dynamic spacial sequences, in which the observer is expected to move through the space so that he may fully experience its character and impact. Only in movement can the "lense effect" of the colonnades be fully experienced. When moving along the major axis of the nave or aisles the distant perspective view of the colonnade as a closed surface gradually changes in those portions of the colonnade closest to the observer, opening diagonal views of the adjacent spaces. This effect of continuously changing views of the colonnade and of the adjacent spaces, heightened to an intense rhythm as each column is approached and passed until the distant end of the nave is reached can be experienced only in movement and adds considerably to the dynamic quality of the aisled basilica. The dynamic impact is still further enforced by the strengthening of the sense of perspective depth, which is achieved by the use of unbroken horizontals, and by the use of uniform forms in the clerestory and colonnade to emphasize the effect of perspective diminution (Fig. 4, 7-8.)

The serial symmetry of the colonnades and clerestories (ababab) produces the quality of anonymity in the aisled basilica. Each unit of the colonnades and clerestories is the same as each other unit, has the same size, the same proportions, and the same value in the total architectural composition. There is no legible center, no pronounced beginning, no decisive ending. All internal relationships within the clerestories and colonnades are equal. Additional units in the sequence would make little or no difference to the composition and spacial effect of the church building. Anonymity implies that no unit has value as an independent member; each column, each window has a place in the composition of the church only as a link in the rhythmic chain of the colonnade or clerestory.

The diaphanous views through the Constantinian basilica, the dynamic movement along the nave and aisles, the powerful perspective depth, the anonymous relationships within the colonnades and clerestories are brought to a decisive ending and resolved only in the apse or equivalent spacial unit (Fig. 4,6). The apse is the focal point of the architectural composition not only because of its location at one end of the major axis of symmetry, and not only because of its spherical and cylindrical, Platonically more perfect forms, but also because it is only here that diaphanous views are impossible, that dynamic movement is contrasted with static restfulness, that the lines of perspective depth are collected.

In general architectural details are de-emphasized, not to say neg-

lected. The wall surfaces seem either to have been faced with mosaic or with marble. Regardless of the material used the effect was flat, usually with little or no plastic relief, non-structural, and dematerializing [8]. The decorative value of the wall covering was concentrated in the two-dimensional face of the wall, in keeping with the pure geometry of the volumes. The flatness, the taut surface tension of the interior forms is usually broken only in the plastic treatment of the capitals and mouldings which, perhaps because they were considered to be un-important, were either re-used spoils or designed in conformance with existing tradition [9]. Architectural carving with the same flat, taut surfaces found in the major forms of the Constantinian basilica was to be developed only in the following decades and centuries. The illusionistic, plastic modelling of mosaic representations also stood in uncomfortable contradiction to the desired flatness of the wall surfaces. This contradiction, which seems to have been caused by the strength of prevailing tradition in the representational arts was also to be overcome only in following decades and centuries. It is my belief that the flatness which was eventually achieved in Byzantine monumental representational art was due, if only in part, to the desire to adjust the Classical tradition surviving in the figurative arts to the goal of formulating architectural space in terms of pure Euclidean geometry.

The appearance of the exterior of the Constantinian basilica seems to have been far less important than that of its interior, for reasons which may be readily found in the congregational function of the building. The exterior forms are clear and simple to comprehend. They reflect the interior solutions more or less directly, and are composed with equal emphasis on precise geometric volumes. The classical vocabulary has been reduced to a rhetorical minimum, producing an effect which lacks pretensions and achieves monumentality only by the judicious use of scale and by the juxtaposition of volumes, planes, and openings (Fig.12).

The only major difference between the basilica and centralized solutions in the First Byzantine architectural style is that the centralized solutions lack the dynamic directional impact of the basilica (Fig. 9). In the centralized solutions the same organizational principles and individual forms are used to achieve a static space concentrated upon its own center. Aside from the many similarities in the use of numerous architectural features and details the common denominator between these two antipodes of architecture is the directness, not to say single-mindedness with which each solution has been planned and organized. The dynamic qualities and perspective depth of the basilican solution must therefore not be understood as primary goals of the First Byzantine architectural style, but rather as secondary features which were used to achieve an immediacy and directness in the resolution of the architectural problem at hand which, it seems to me, is one of the most important characteristics of the style.

A more detailed analysis of the First Byzantine architectural style in centralized solutions, in non-liturgical buildings, and in design at the urban scale is not possible within the limitations of this paper and will be presented elsewhere.

The most important stylistic characteristics of numerous buildings constructed in the following two to three centuries throughout most of the former Roman Empire differ only slightly from those outlined above and must be considered to belong to the same style (Fig.10-13). To be sure, numerous local and regional variants and developments exist but they do not alter the general, over-all consistency of the style any more than the general, over-all consistency within the Rococo style is altered by the Bavarian or Venetian variants. To the contrary, the unity within the First Byzantine architectural style, with only relatively minor variations is astounding, considering the vast area, the great diversity of local traditions, and the very long period of time involved.

The mid-4th century Church EA at Sardis, for instance, a basilica with a projecting apse fits well into our stylistic analysis of the Roman basilica (Fig. 1). Double engaged columns used in its construction were created with complete disdain for ornamentation, for even the capitals lack leaves and the shafts are almost without entasis (Fig. 3). In 4th century Asia Minor, therefore, the clear flat geometric forms found in Rome primarily in major architectural features were also employed in architectural details [10].

In spite of its longevity and its prevalence in a vast area the First Byzantine architectural style does not seem to have enjoyed its preeminence for very long. Probably in the late 4th century San Lorenzo in Milan was built using complex spacial units, varied rhythmic groupings, and interlocking geometric and structural systems quite foreign to the First Byzantine architectural style (Fig. 5) [11]. The qualities inherent in its design are characteristic of the Second Byzantine architectural style, which reached its full maturity and produced its greatest achievements during the reign of Justinian. Perhaps because of its greater complexity it never achieved the broad popularity of the First Byantine architectural style, and it never managed to replace it entirely. Relatively pure examples of the First style can be found throughout the 6th century, while other buildings, erected in the late 5th and 6th centuries can be understood stylistically only as products of the First style combined with specific aspects of the Second style without, however, accepting its full repertoire of stylistic characteristics (Fig.21). Several essential characteristics of the First Byzantine architectural style, moreover, for instance the taut surface

tension and the diaphanous linking of spaces continue to be important not only in the Second Byzantine architectural style, but throughout the history of Byzantine architecture. The First Byzantine architectural style must therefore be thought of as the cornerstone of Byzantine architecture, upon which all subsequent phases and currents rest.

Having described the later limits of the First Byzantine architectural style, if only in a thumb nail sketch without attempting to achieve precision, it remains to establish its earlier limits, to draw the line between our style and what preceded it. Much has been done in recent decades to clarify the origins of the basilican church type in Roman and pre-Roman architecture, and certain characteristics of our style have been traced in buildings constructed in previous centuries [12]. There can be no doubt that the First Byzantine architectural style was at least in part a product of evolution. The question must therefore be posed, whether the distinction between our style and other architectural currents of Late Antiquity is justified, or whether the differences are not merely functional, due to the exigencies of the newly established religion?

On the other hand clearly no architectural style of any period has been developed without precedents. Every style of architectural history has antecedents and it is by no means always easy to define the beginning of a style with precision. Moreover, the First Byzantine architectural style must be defined by the relatively consistent use of numerous characteristics which can be demonstrated in a number of buildings erected during a continuous period of time. As I have already noted, the major buildings may be expected to emanate from the center of power, initially the Imperial court in Rome. The style cannot be understood in terms of occasional examples of building types or aspects, found in scattered locations, at times constructed decades or centuries apart.

A comparison of the Constantinian Christian basilicas with the Basilica Nova of Maxentius, begun only a few years before Constantine's accession to power and completed under Constantine is most telling in clarifying the issues (Fig. 14) [13]. The nave of the Basilica Nova is not a discreet, simple, clearly defined geometric volume, but is rather sub-divided into three equal parts by its groined vaults and by the column articulation. The nave lacks the powerful directional dynamics of the church nave not only because it lacks the elongated proportions, the rhythmic persistence of the colonnades, and the relentless continuity of the clerestory, but also because its flanking walls open onto huge niches, placing strong emphasis on the lateral axes and providing a harmonic balance between the lateral and the

longitudinal directions within the building which is antithetical to the character of the Constantinian basilica. Its awesome loftiness, in itself antithetical to the spirit of the Constantinian basilica is produced in part by the structural device of hiding the enormous lateral buttresses which support the major vaults inside the walls located between the niches, and pretending that the vaults are supported by the eight slender columns which articulate the nave walls. Nothing could be more foreign to the stylistic character of the Constantinian Christian basilica, in which no structural devices are used to enhance the architecture, in which the column is shown to carry exactly what it actually does carry. Equally foreign to the character of the Constantinian Christian basilica is the enormous pomp and excessive monumentality of the Basilica Nova.

It is difficult to imagine buildings built only a few years apart, all Imperial commissions, all in Rome, and all built on essentially similar floor plans which are more different in character and style than the Basilica Nova and Constantine's Roman churches [14]. Moreover, the Basilica Nova cannot be thought of as an isolated example, for its forms clearly echo those of the Baths of Diocletian built less than a decade earlier, which is partially preserved and has characteristics totally different from those of Constantine's Christian basilicas (Fig. 15).

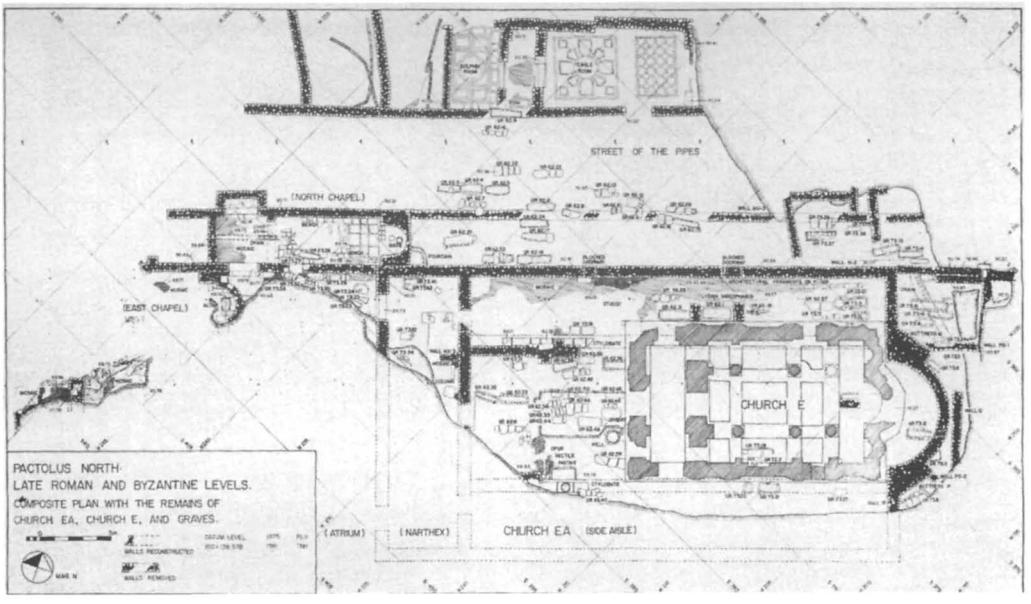
Regardless of the many antecedents in Late Antique architecture these comparisons suggest that the First Byzantine architectural style was deliberately designed to break away from the immediate architectural past, to create what may termed an architectural revolution.

Indeed, a comparison of essential characteristics of the First Byzantine architectural style with those of other styles which may also be thought of as revolutionary is fruitful for gaining further insight not only into the formal qualities of the respective styles, but also for obtaining a deeper understanding of the underlying attitudes the styles may reflect.

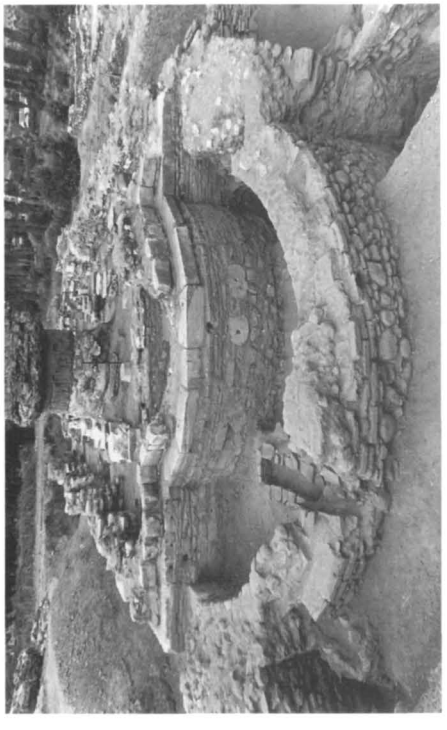
Probably no style of architectural history was more revolutionary in its total impact upon the built environment than the 20th century Modern Movement. Disregarding its innovations in building technology and in the use of architecture as a tool of social planning, perhaps the most striking stylistic innovation of the Modern Movement consisted of boldly replacing the rich detailing and voluptuous spaces of the Art Nouveau and Late Victorian eras with pure and simple, clearly defined, undecorated Euclidean geometry (Fig. 16-17) [15]. Earlier still, late 18th century Rationalist architecture, which has also been termed the Architecture of Revolution, makes a startling break with the tradition of previous centuries. Even though the Classical idiom was not yet entirely shaken off, numerous, for the most part unexecuted designs of the period show pure forms which are taken directly from Euclidean geometry, preferably unadorned except by an occasional Classical detail (Fig.18-19) [16].

A comparison between the latter style and the First Byzantine architectural style is particularly rewarding. Both styles evolved within an idiom of Classical forms with a long standing tradition of many centuries; both styles depended primarily on the use of stark and simple geometric forms; both styles reduced the Classical vocabulary to a minimum without, however, eliminating it entirely; both styles were current in a period of momentous change . While seeking antecedents for late 18th century French Rationalist forms it is not surprising to find that the so-called Palladian motif was used in Italy some two centuries earlier, and that the clear, simple forms of Euclidean geometry may also be found occasionally in the 15th and 16th centuries. Antecedents for the First Byzantine architectural style in Late Antiquity should be no more surprising and should create as little doubt concerning the unique integrity and innovative power of the style.

While similarities among all of these very different styles should not be overemphasized, the fact that there are basic and essential characteristics which they have in common cannot be ignored. The questions why such similarities exist, and why they involve the use of pure and simple geometric forms cannot be easily answered and lie beyond the framework of the present investigation. As a hypothesis and point of departure, however, I suggest that the revolutionary character of each of these architectural styles reflects a revolutionary, revitalizing, and reforming attitude among those who created the styles, an attitude which was essentially idealistic, perhaps not only in the every day definition of the term, but also in its philosophical, Platonic and Neo-Platonic connotations and overtones. Idealism in this respect implies a desire to achieve goals beyond the immediately attainable, goals which can ultimately be grasped only intellectually rather than through the senses. If on the one hand the world was to be improved by making it correspond more closely with an idealized and absolute standard of perfection, then on the other hand man made forms were to be improved by making them comply more closely with an idealized and absolute standard of perfection. It seems only logical that the physical realization of an absolute standard of perfection should involve the reduction of architecture to the pure and abstract, absolute, and ultimately intellectual forms of simple Euclidean geometry.



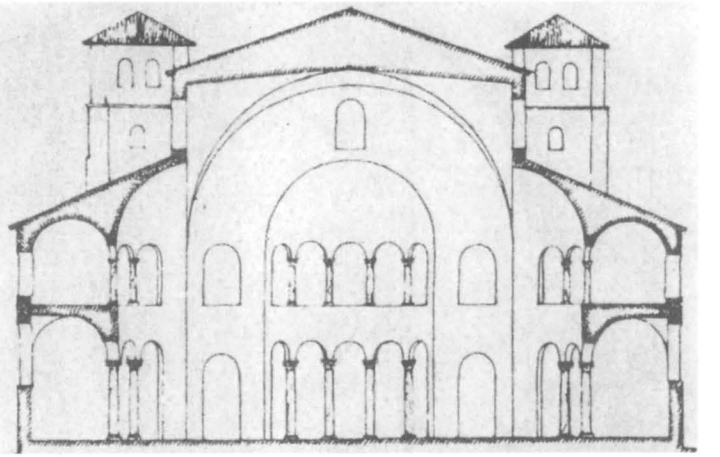
1. Sardis Churches E and EA. Excavation Plan 1980



2. Sardis Church EA Apse with Church E in the Background (1973)

3. Sardis Church EA Double Engaged Column as Found in Situ (1973)

4. St. Peter's in Rome. Reconstruction (Ciampini)



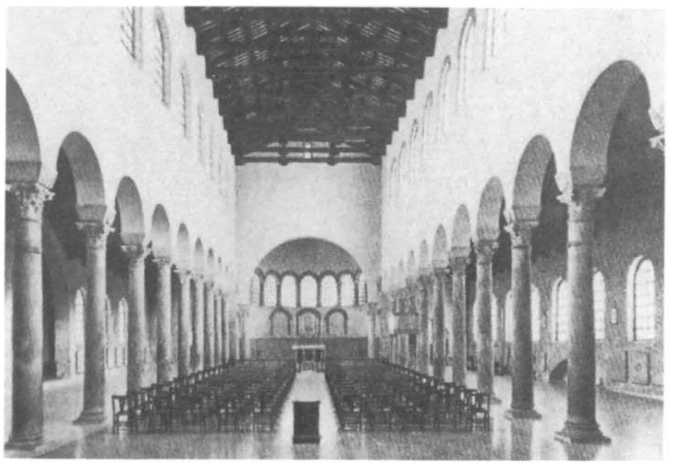
5. San Lorenzo in Milan. Section Restored with Groined Vault over the Nave (Chierici)

6. Santa Sabina in Rome. Nave

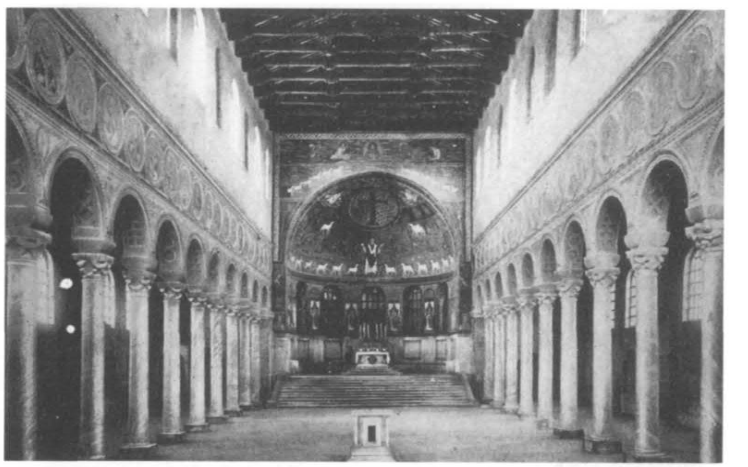
7. San Paolo fuori le Mura in Rome. Nave (Piranesi)

8. Santa Maria Maggiore in Rome. Nave

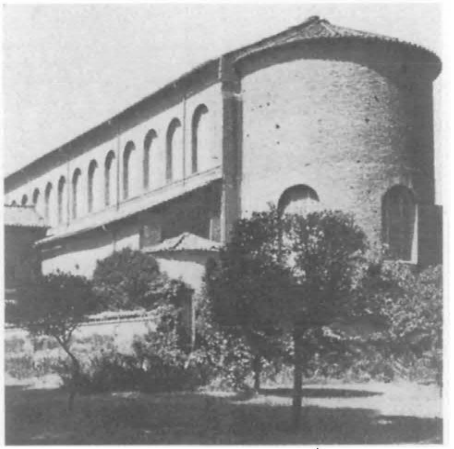
9. Santa Costanza in Rome



10. San Giovanni Evangelista in Ravenna. Nave

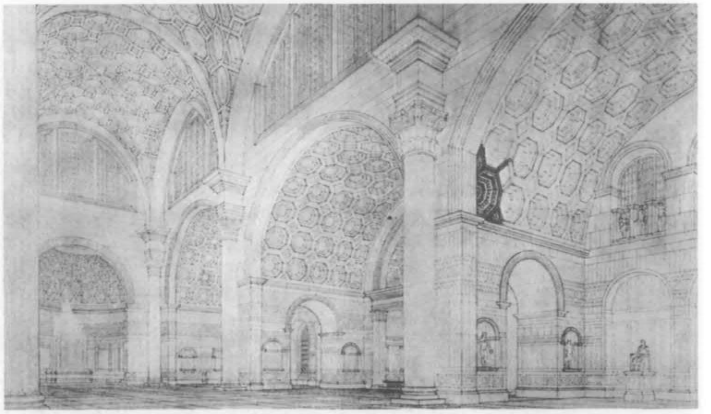


11. San Apollinare in Classe near Ravenna. Nave

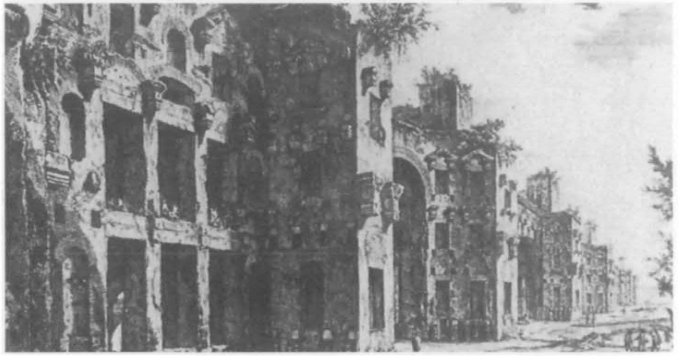


12. Santa Sabina in Rome from the SE

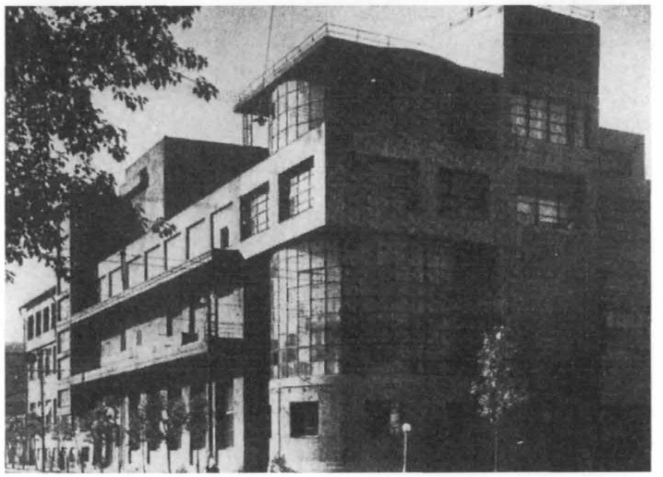
13. San Apollinare in Classe near Ravenna from the NE



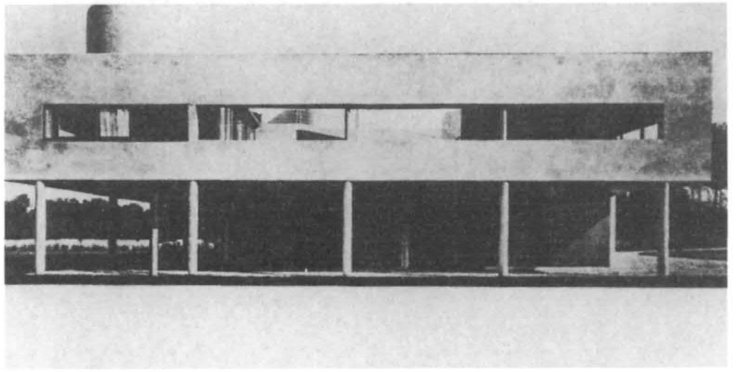
14. Basilica of Maxentius in Rome. Reconstruction View of the Nave (Minoprio)



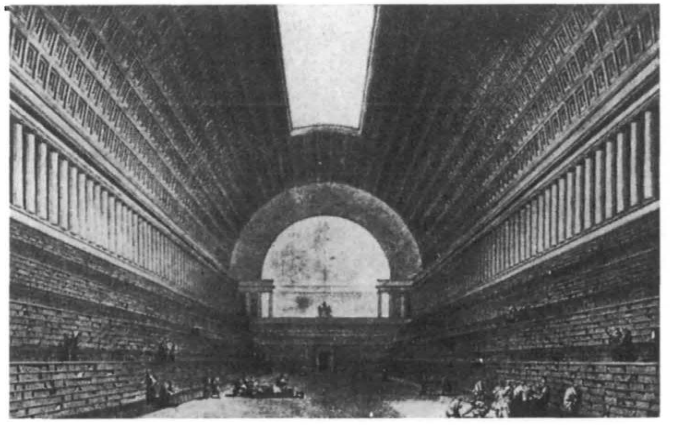
15. Baths of Diocletian in Rome. Facade of the Frigidarium seen from the Pool (Piranesi)



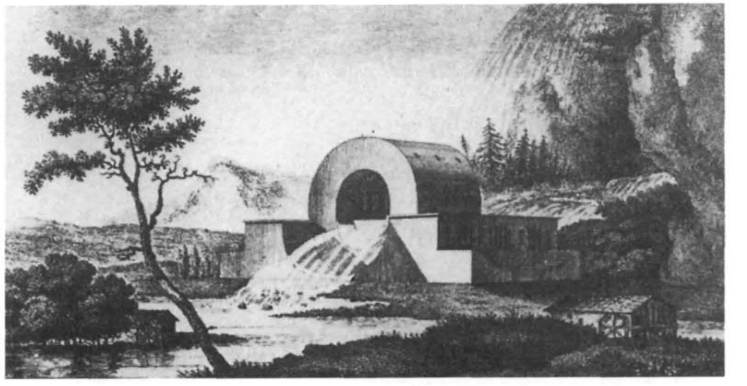
16. Zuyew Club in Moscow by I. P. Golosow. Built 1928



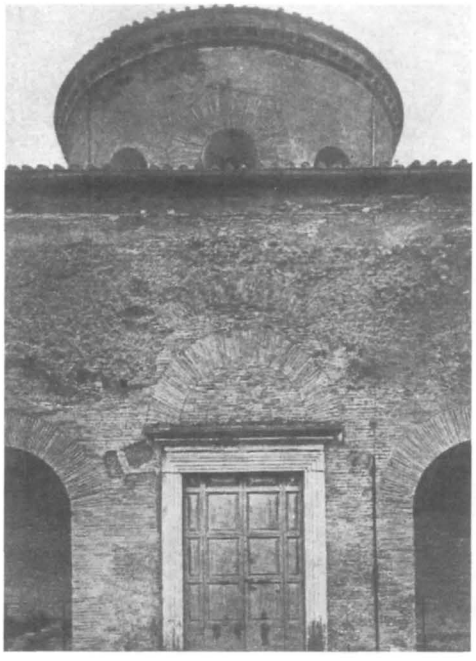
17. Villa Savoye in Poissy near Paris by Le Corbusier. Built 1929—1931



18. Project for the Main Reading Room of the Bibliothèque Nationale in Paris by E.-L. Boulée. About 1785

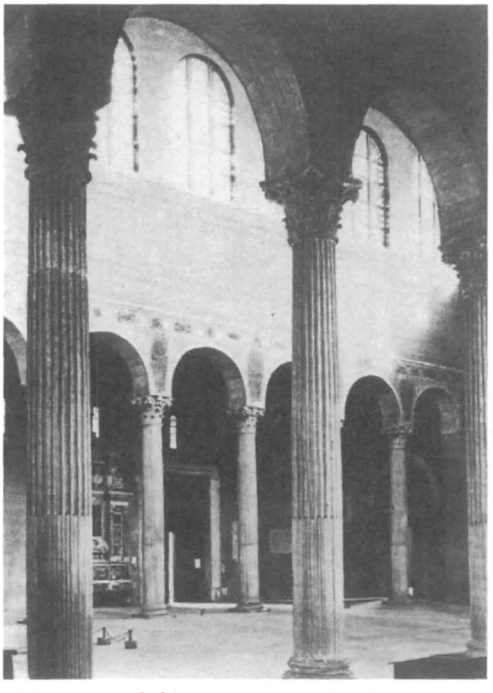


19. Project for the House of the Inspector of Rivers on the Loue by C.-N. Ledoux. First published 1804

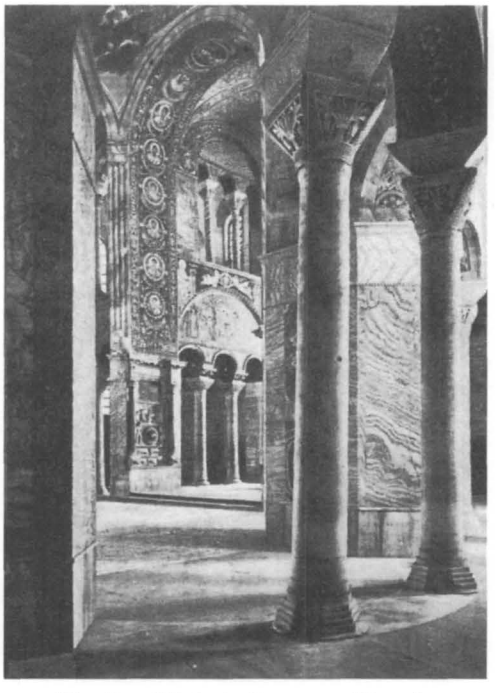


20. Santa Costanza in Rome. Exterior

21. Basilica B in Resafa. View from Side Aisle towards the Nave



22. Santa Sabina in Rome. View from Side Aisle towards the Nave



23. San Vitale in Ravenna. View from Ambulatory towards the Apse

1. A summary will appear in H. BUCHWALD, The Early Christian Basilica EA and Church E. Sardis from Pre-historic to Roman Times. Cambridge, Mass. (in print); a full account will appear in idem, The Churches of Sardis, in the series Archaeological Exploration of Sardis. Cambridge, Mass.; G.M.A. HANFMANN, The Sixteenth Campaign at Sardis (1973). Bulletin of the American Schools of Oriental Research 215 (1974); idem, Restoration and Excavations at Sardis - 1973. Türk Arkeoloji Dergesi, 1975.

2. Particularly M. SCHWARZ, Das Stilprinzip der altchristlichen Architektur. Konstantin der Grosse und seine Zeit, ed. F.J. Dölger, Freiburg i.Br., 1913; S. GUYER, Rom und die altbyzantinischen Architekturformen. Atti del V. Congresso Intern. di Studi Bizantini, 1936; E. KIRSCHBAUM, Der Raumcharakter der altchristlichen Basilika. Rivista di archeologia cristiana 13 (1936).

3. Above all F.W. DEICHMANN, Frühchristliche Kirchen in Rom. Basel 1948, p. 11ff.; idem, S. Agnese fuori le Mura und die byzantinische Frage in der frühchristlichen Architektur Roms. BZ 41 (1941); idem, Wandsysteme. BZ 59 (1966); also H. SEDLMAYR, Spätantike Wandsysteme.Sitzungsberichte der Bayerischen Akademie der Wissenschaften, Phil.-Hist. Klasse, 1958; C. DELVOYE, Architecture paléobyzantine à Constantinople aux IVe et Ve siècles. 23. Corso di Cultura sull' Arte Ravennate e Bizantina (1976); E.H. SWIFT, The Formation of the Byzantine Style. JÖBG 2 (1952); R. KRAUTHEIMER, The Architecture of Sixtus III: a Fifth-century Renascence? De artibus opuscula XL. Essays in Honor of Erwin Panofsky. New York 1961.

4. Particularly F.W. DEICHMANN, Wandsysteme; idem, Basilica, B. RAC I, 1249ff. (1950); J.B. WARD-PERKINS, The Italian Element in Late Roman and Early Medieval Architecture. The Annual Italian Lecture of the British Academy. Proceedings of the British Academy XXXIII (1947); idem, Constantine and the Origins of the Christian Basilica. Papers of the British School at Rome 22 (1954); R. KRAUTHEIMER, Constantine's Church Foundations. Akten des 7. Intern. Kongresses für Christliche Archäologie, 1965; idem, The Constantinian Basilica. DOP 21 (1967); idem, Early Christian and Byzantine Architecture. Harmondsworth 1975, p. 41 ff.; C. DELVOYE, Recherches récentes sur les origines de la basilique paléochrétienne. Annuaire de l'Institut de Philologie et d'Histoire Orientales et Slaves 1954-57; N. DUVAL, Les origines de la basilique chrétienne. L'information d'histoire de l'art 1961; J. LASSUS, Sanctuaires chrétiens de Syrie. Paris 1947, p. 45 ff., 101 ff.; E. LANGLOTZ, Der architekturgeschichtliche Ursprung der christlichen Basilika. Rheinisch-Westfälische Akademie der Wissenschaften, Vorträge G. 172 (1972) p. 56 ff.; Die Ursprünge der

christlichen Basilika. Kunstchronik 4 (1951) p. 97 ff.; A.K. Orlandos, ΒΑΣΙΛΙΚΗ Athens 1952-57, passim; C. Mango, Architettura Bizantina. Milan 1974, p. 58 ff.; R. GÜNTER, Wand, Fenster und Licht in der trierer Palastaula und in spätantiken Bauten. Herford 1968; all with further references.

5. For instance R. KRAUTHEIMER, Early Christian and Byzantine Architecture.

6. I will dispense with references to individual buildings and authors because the material is well known and descriptions, discussions, and illustrations are readily available in many of the works cited under n. 3 and 4. Because none of the Roman Constantinian basilicas remain in their original state my illustrations include other similar buildings.

7. Cf. DEICHMANN, Wandsysteme, p. 350 f. for notable exceptions. The relief of the pilaster articulation, however, is usually flat and rhetorical in character, and it permits neither the mass nor the structural coherence of the wall to become an important part of the architectural experience. SCHWARZ, Stilprinzip, p. 351 ff. and SEDLMAYR, Spätantike Wandsysteme, passim, discuss wall typologies and confuse them with architectural style, an observation already made by DEICHMANN, ibid. p. 354 f., who traces the first wall to 2. cent. A.D. Roman architectural predecessors.

8. Cf. above, n. 7.

9. DEICHMANN, Frühchristliche Kirchen, p. 21, 44 ff.; idem, Il materiale di spoglio nell' architettura tardoantica. 23. Corso di Cultura sull' Arte Ravennate e Bizantina, 1976.

10. Cf. above, n. 1.

11. A. CALDERINI, G. CHIERICI, C. CECCHELLI, La basilica di S. Lorenzo Maggiore in Milano. Milan 1951; J.B. WARD-PERKINS, The Italian Element; W.E. KLEINBAUER, 'Aedita in turribus': The Superstructure of the Early Christian Church of S. Lorenzo in Milan. Gesta 15 (1976) with further references.

12. Cf. n. 4, particularly DEICHMANN, Wandsysteme, passim.

13. A. MINOPRIO, A Restoration of the Basilica of Constantine, Rome. Papers of the British School at Rome 12 (1932); J.B. WARD-PERKINS, Architettura Romana. Milan 1978; D.S. ROBERTSON, Greek and Roman Architecture, 2nd ed. Cambridge 1971, p. 261 ff.

14. KIRSCHBAUM, Raumcharakter, p. 272ff. makes a similar comparison in a different context; KRAUTHEIMER, Constantine's Church Foundations, p. 247 ff. takes issue with this comparison. KRAUTHEIMER'S arguments are narrowly functionalistic and seem to automatically rule out other form producing impulses; moreover, he underestimates the technical difficul-

ties involved in the stabilization of a large timber covered basilica, which was made to look simple, but which was not simple statically; numerous obvious possibilities of stabilizing the long, unbraced clerestory walls were avoided for about 200 years only, I believe, for stylistic reasons; he also fails to recognize that vaulting, often at a large scale, created no unusual difficulties for builders in much of the Roman territories in the early 4th century, while timber of adequate size was frequently difficult to obtain; when vaulting was finally more generally used for churches, in some areas in the 6th, in others as late as the 11th century building technology was far less sophisticated.

15. W. GROPIUS, Internationale Architektur. Munich 1925; B. ZEVI, Storia dell' architettura moderna. Turin 1950; H.R. HITCHCOCK, Architecture: 19th and 20th Centuries. Baltimore 1958, p. 349 ff.; U. KULTERMANN, Die Architektur im 20. Jahrhundert. Cologne 1977, among many others, all with further references.

16. E. KAUFMANN, Architecture in the Age of Reason. Cambridge, Mass. 1953; idem, Von Ledoux bis Corbusier. Vienna 1933; idem, Three Revolutionary Architects - Boullee, Ledoux and Lequeu. Transactions of the American Philosophical Society 42 (1952); E. SEKLER, Formalism and the Polemical Use of History. Harvard Architectural Review 1980 for an account of Rationalist 18th century elements in contemporary architecture.

X

CRITERIA FOR THE EVALUATION OF TRANSITIONAL BYZANTINE ARCHITECTURE

Transitional Byzantine architecture is more easily defined and understood in terms of architectural forms than in terms of dates, rulers, dynasties or historic events.

Transition is defined as the passage from one position, state or stage to another. Taking this definition literally, the forms of most buildings are *transitional* to those of other buildings. An innovation in one building is often carried on in a subsequent structure and modified or changed in some manner. Seldom are two buildings of historic architecture exactly alike.

Nevertheless, in some periods buildings tend to be relatively similar and standard, while in others there is a tendency toward differentiation and innovation. In Byzantine architecture, there are examples of both.

Elsewhere I distinguished between four styles in Byzantine Architecture[1]. Style I is dominated by buildings which are generally clear and simple in conception. After an initial highly innovative impact, there is a strong tendency toward continuity and the construction of standard solutions. The most important contribution and dominant building type of Style I is the *basilica.* Style II is characterized by numerous variants and highly differentiated buildings which are spacially richer and more complex than those of Style I; there is no dominant building type. In style III several earlier forms were combined into complex but standard types which were repeated many times with only slight variations; the *inscribed cross church* is the dominant building type. Style IV retrospectively repeats, modifies, and combines forms of earlier periods, and will not concern us here.

The purpose of this investigation is to explore the question, how the transition from the dominant building type of Style I to that of Style III may have been achieved.

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[1] H. Buchwald, The First Byzantine Architectural Style, Evolution or Revolution? in: Akten XVI. Int. Byzantinistenkongreß II/5 = *JÖB* 32/5 (1982) 33–45; idem, Western Asia Minor as a Generator of Architectural Forms in the Byzantine Period, Provincial Back-wash or Dynamic Center of Production? *JÖB* 34 (1984) 199–234; idem, Der Stilbegriff in der byzantinischen Architektur. *JÖB* 36 (1986) 303–316.

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The question is not academic. Many important issues are involved which profoundly influenced architectural development both in the Byzantine sphere and in Western Europe for at least a millenium.

The aisled basilica, the most prominent church form of Style I, was a standard type constructed in many parts of the Byzantine Empire hundreds of times in the period between the early 4th century snd the early 7th. It provides the underlying form for most churches of the Carolingian, Romanesque, Gothic and Renaissance styles. Seen in this perspective, it is one of the most successful, important and fruitful building types of architectural history.

In the Christian Middle Ages, only in Byzantine and closely related architecture did the basilica *not* provide the underlying concept upon which most churches were designed.

It is important to note that of all the architectural traditions which developed upon the soil the Roman Empire, only in the Byzantine sphere was there continuity between Late Antiquity and the Middle Ages. In most of the former Roman realm in Europe, Africa and the Middle East invasions and new religious convictions terminated continuity in religious architecture, even though Christian architects and artisans may have contributed to some of the new forms. In Byzantium and closely aligned areas, on the other hand, the thread of architectural tradition, however thin and poorly known, continued. It is an anomaly worth exploring, that in spite of, or possibly because of the continuity in Byzantine architecture, the most important church type of the Late Roman Empire, the basilica, was discarded and eventually replaced by a building form which, though perhaps ultimately related to the basilica, was quite different in emphasis and in the formulation of spacial features.

The inscribed cross type, together with its integral figural decoration, was one of the primary achievements of Byzantine architecture and of Byzantine civilisation[2]. It dominated Byzantine church construction probably from the 9th century to the 12th. The question of transition from Style I to Style III may therefore be posed in terms of how this church type originated, and what its relationship to earlier architectural forms may have been.

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[2] H. Buchwald, The Geometry of Middle Byzantine Churches and Some Possible Implications. *JÖB* 42 (1992) 293–321, for a more detailed discussion of the inscribed cross type, which is also called, less aptly, I believe, the "cross in square", "four column" or "quincunx" church type.

X

I recently examined the forms of inscribed cross churches in some detail, and need only briefly refer to those characteristics here, which will be important in tracing its inception[3].

Invariably much smaller in scale than common in earlier examples, these churches reflect a harmonious combination of basilican, centralized and cruciform elements so expertly united, that none may readily be disconnected, in the mind's eye, from the others. The Classical rule of thumb, that in a beautiful building no part can be added or taken away without detrimentally influencing its appearance, can without hesitation be applied to inscribed cross churches.

Aspects which reflect basilican components include the large and high nave flanked by smaller, lower spaces, the directional, axial movement from the west toward the conch of the apse in the east, and the four columns near the center. The major centralized element is the dome on a drum supported by pendentives near the center of the building, while the cruciform is represented by the four barrel vaults which radiate outward from underneath the dome, covering the nave and transepts. Each of these architectural elements is equally strong in the total architectural composition, and may be directly experienced both from outside and inside the building.

The most important aspect of our question concerning the origin of the inscribed cross type is how these architectural components were united in a single building. Other significant questions are: 1. When was the inscribed cross church first conceived? 2. Where did it originate? 3. Who was responsible for its origin? 4. Why was it originated, or why was it chosen to be the most prominent church type of its time? 5. Why was it realized at such a diminutive scale?

Most of these questions are closely related. None may be answered definitively at present, because of the lack of firm evidence. This investigation will concentrate upon the first question, concerned with how the individual architectural components were amalgamated, not only because of its inherent interest, but also because it may be approached, though not resolved, using standard tools of formal comparison common to the study of architectural history of most periods. With the use of formal analysis, only limited dependence upon the documentary evidence, which is so inadequate in resolving these issues, will be required[4].

* * *

[3] *Ibid.*

[4] C. MANGO, Byzantine Architecture. Milan 1978 (1st paperback ed. London 1986), pp. 96–98, discussed the genesis of the inscribed cross church, using a very different approach, and emphasized the lack of firm documentary evidence.

The design of the first inscribed cross church reflects great ingenuity and inventiveness. Immediate predecessors are unknown.

No series of buildings which steadily develop to the full and mature solution can be demonstrated; nothing comparable is known, in Byzantine architecture, to the sequence of buildings in 12th century France which eventually culminated in the Gothic cathedral.

On the other hand, it seems reasonable to suppose that the Byzantine architect[5] who invented the inscribed cross scheme was able to visualize the form based upon previous buildings which, in some respects, were similar. The inscribed cross church was a new solution, but its architect was probably inspired by other solutions with some similar features.

If the inscribed cross scheme was a harmonious amalgamation of basilican, domed, and cruciform churches, then it is of interest, when tracing solutions which may have inspired its inception, to identify earlier buildings in which these features are also united. By comparing the earlier buildings, we can better evaluate the achievement of the architect who first designed an inscribed cross church.

* * *

Each of the basic components tracable in inscribed cross churches may be found already in the 4th century, and was current in Style I, even though some details, such as pendentives, became common only in Style II. The aisled basilica was omnipresent in many parts of the Empire and requires neither explanation nor examples. Buildings such as Santa Costanza in Rome, and numerous baptisteries in many locations provide examples of Christian buildings dominated by a central dome. The cruciform is somewhat less common, but known in a relatively pure and simple form in such buildings as St. Babylas at Antioch-Kausiye and the Mausoleum of Galla Placidia in Ravenna[6].

Combinations of these basic forms of Christian architecture occured almost from the outset. Niches in circular buildings like Santa Costanza in Rome and the Baptistery of St. Mary's in Ephesus subtly suggest cruciforms. In the rich experimental forms developed in Style II the combination of round and cruciform types is more pronounced. Examples include

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[5] I use the term *architect* in today's sense, as the person who was responsible for the form of the building, regardless of his training or title during his lifetime.

[6] All of these buildings, and those in subsequent passages are well known. See particularly C. MANGO, ibid., pp. 35-56, for further discussion; also R. KRAUTHEIMER, Early Christian and Byzantine Architecture (*The Pelican History of Art*). Harmondsworth 1965 (rev. 1975), *passim*, both with further references.

tetraconch churches such as S. Lorenzo in Milan and the Cathedral of Bosra. However, in all these buildings the cruciform is composed of exedrae which bear little resemblance to the barrel vaulted cross arms of inscribed cross churches. These and similar Style II buildings do not seem to provide a transition to Style III.

Essential features of inscribed cross churches more closely resemble those of a small and varied group of basilicas with transepts and a dome over the crossing, such as St. Sophia in Sofia, Basilica B in Philippi, the Katopoliani on Paros and St. Titus at Gortyna[7]. They are usually attributed to the period 540–600. Each of the buildings shows a tendency to combine earlier forms, including basilicas, domes and cruciforms. However, even though the group is very generally comparable with the inscribed cross type, numerous discrepancies make it unlikely that these churches directly inspired it.

The differences in scale are apparent: the interior dimensions of the naos of an early inscribed cross church range between about 8 and 12 meters[8]; those of a comparable domed transept basilica between about 18.50 and 35. The naos of Basilica B could contain that of the Myrelaion about 15 times, and that of Zeytinbagi about 7[9]. In contrast to inscribed cross churches, most of the buildings of this group had galleries. In all of these examples the nave is relatively long and much more pronounced than in standard inscribed cross churches, and the dome is located not near the center, but over the eastern end of the naos, before the bema. The biaxial symmetry typical of inscribed cross churches is lacking in this group of buildings.

In several respects cross domed basilicas are more similar to inscribed cross churches than are domed transept basilicas[10]. The most important examples are the domed phase of St. Mary's in Ephesus[11], St. Sophia in

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[7] Particularly MANGO, *ibid.* 86; KRAUTHEIMER, *ibid.* 266–270.

[8] Myrelaion ca. 8.00×8.60; Fenari Isa ca. 9.30×9.30; Zeytinbagi (Tirilye) ca. 12.00×12.00; Pelekete ca. 10.40×(unknown); Church H in Side ca. 8.00×9.50. The dimensions are approximate and were scaled from published plans but are sufficiently precise for our purpose.

[9] Gortyna ca. 18.50×21.60; Paros ca. 21.00×23.40; Sofia ca. 21.00×30.00, Basilica B ca. 30.00×35.00.

[10] H. BUCHWALD, The Church of the Archangels in Sige near Mudania. Vienna 1969, 45–63, for a more detailed discussion of the building type (the dates of some of the churches require revision); idem, Western Asia Minor as a Generator of Architectural Forms, 219–223; C. MANGO, Byzantine Architecture, particularly 89–96, each with further references.

[11] Forschungen in Ephesus 4/1. Die Marienkirche. Vienna 1932, 51ff.; C. FOSS, Ephesus after Antiquity: a Late Antique, Byzantine and Turkish City. Cambridge 1979, 52, with extensive further references.

Salonica[12], the *Koimesis* in Iznik[13] and St. Clement in Ankara[14]. None is firmly dated, but all have been attributed to the period beginning with the late 6th century and ending with the 8th. These churches have typical characteristics of aisled basilicas, usually with galleries, and include a dome near the center of the nave supported by pendentives and four barrel vaults. They differ from domed basilicas such as the Church at Kasr Ibn Wardan and St. Nicholas at Demre in that the lateral barrel vaults supporting the dome are spacially defined inside the naos. Nevertheless, structurally and spacially their close relationship with, and probable derivation from that building type is immediately evident.

The strongest similarity between cross domed basilicas and inscribed cross churches is the central location of their domes, which are supported by four pendentives and four barrel vaults. The differences are equally apparent: 1. The lack, in cross domed basilicas, of the ingenious four column solution underneath the dome; 2. The limited width, in cross domed basilicas, of the lateral barrel vaults, which are not clearly legible as the arms of a cross; 3. The lack of full flanking aisles and galleries in inscribed cross churches.

The scale of cross domed basilicas and inscribed cross churches may be compared in the same context. St. Sophia in Salonica and the domed phase of St. Mary's at Ephesus are much larger than any known medieval inscribed cross church. But in the *Koimesis* at Iznik and St. Clement in Ankara the dimensions of the naos, without the aisles, are comparable to those of early inscribed cross churches.

Our overview of churches which may have been transitional between basilicas and inscribed cross churches may be completed with a small group of buildings, which are clearly variants of the cross domed basilica. The Church of the Archangels in Kumyaka (Sige), probably built about 780, is

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[12] K. Theoharidou, The Architecture of Hagia Sophia, Thessaloniki (*BAR International Series* 399). Oxford 1988, for an extensive new account with new dating and further references; in Church of the Archangels, 43, I proposed a date in the last quarter of the 8th century based upon an existing inscription and monograms which are not adequately considered by Theoharidou; Mango, Byzantine Architecture 89, suggests that the church may have been constructed in commemoration of a major victory in 783.

[13] T. Schmitt, Die Koimesis-Kirche von Nikaia. Berlin, Leipzig 1927; the evidence for the date is summarized in Buchwald, Church of the Archangels 44, with further references; also U. Peschlow, Neue Beobachtungen zur Architektur und Ausstattung der Koimesiskirche in Iznik. *IstMitt* 22 (1972) 145ff.

[14] G. de Jerphanion, Mélanges d'archéologie anatolienne, in: Mélanges de l'Université Saint-Joseph 13. Beirut 1928, 113ff.; evidence for a date in the 7th century is summarized in Buchwald, Church of the Archangels 45–62.

an abbreviated version of the type, with neither true galleries nor original aisles[15] While the lack of these features may have been due to site or other, unknown, conditions, it is of interest to note that neither galleries nor aisles were common in early inscribed cross churches, some of which may have been roughly contemporary.

Cross domed basilicas with inscribed aisles are more similar to inscribed cross churches than are other cross domed basilicas, because their lateral arches are wider and may be experienced more readily as the arms of a cross[16]. This group includes the reconstruction of St. Irene in Istanbul after the earthquake of 740[17], the Church at Dereagzi, perhaps built in the 9th century[18], and St. Sophia at Vize[19]. They are like other cross domed basilicas, except that their lateral arches are wider, and their aisles are located underneath, rather than flanking the lateral cross arms.

* * *

A brief outline of currently known early inscribed cross churches will be useful.

The earliest preserved inscribed cross churches dated by documentary evidence are the North Church of the Fenari Isa Camii (Monastery of Constantine Lips) and the Bodrum Camii (Myrelaion Church), both in Istanbul and both datable to the early 10th century[20].

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[15] H. Buchwald, The Church of the Archangels in Sige near Mudania. Vienna 1969.

[16] *Ibid.* 52–62 for the definition of the type and descriptions of the most important examples, with further references.

[17] U. Peschlow, Die Irenenkirche in Istanbul (*IstMitt*, Beih. 18). Tübingen 1977, with references.

[18] J. Morganstern, The Church at Dereagzi – a Preliminary Report. *DOP* 17 (1968) 161–168; idem, The Church at Dereagzi – Second Preliminary Report. *DOP* 18 (1969) 85–91; idem, The Church at Dereagzi: its Date and its Place in the History of Byzantine Architecture, in: Actes du XIVe Congrès Intern. des Études Byzantines, III. Bucarest 1971, 385–394.

[19] C. Mango, The Byzantine Church at Vize (Bizye) in Thrace and St. Mary the Younger. *ZRVI* 11 (1968) 9–13; S. Eyice, Trakyáda Bizans Devrine Ait Eserler. *Belleten* 33 (1969) 358ff.; F. Dirimtekin, Church of St. Sophia (Süleyman Pasa) at Vize. *Ayasofya Müzesi Yilligi* 3 (1961) 47–49.

[20] For the Fenari Isa Camii, A. H. S. Megaw, The Original Form of the Theotokos Church of Constantine Lips. *DOP* 18 (1964) 279–298; idem, Notes on Recent Work of the Byzantine Institute in Istanbul. *DOP* 17 (1963) 333–371; C. Mango, E. J. W. Hawkins, Additional Notes. *DOP* 18 (1964) 299–315; idem, Additional Finds at Fenari Isa Camii, Istanbul. *DOP* 22 (1968) 177–184.
For the Bodrum Camii, C. L. Striker, The Myrelaion (Bodrum Camii) in Istanbul. Princeton 1981.

However, they are probably not the earliest of their kind. Several buildings survive, some only as ruins, which cannot be dated by documentary evidence, but which may be earlier. Three criteria are particularly useful in identifying inscribed cross churches which may have been built before the 10th century: 1. Parts of the church, for instance the spaces flanking the major apse, do not comply with standard solutions of the 10th–11th centuries, but rather, with those of earlier buildings. 2. Exterior surfaces are unarticulated without the recessed arcades and other features typical of most Byzantine churches from the 10th century onwards. 3. Exterior masonry is stratified in alterning layers of brick and ashlar[21]. However, in some regions local tradition may have caused unusual or outdated architectural features, and stratified masonry was also used in other periods. These criteria must therefore be used with caution. Ideally, at least two or all three characteristics may be found in a single building.

Using these criteria, the following inscribed cross churches may possibly be attributed to the period before the 10th century:

1. The church of St. John in Trullo in Istanbul, which is usually assigned to the 11th–12th centuries. The evidence which points to a pre-10th century date includes the sparce exterior facade articulation and the stratified masonry, which was radically altered in a recent restoration[22].

2. The Fatih Camii in Zeytinbagi (formerly Tirilye, Trigleia) on the south shore of the Marmara. The exterior forms are unarticulated and the spaces flanking the major apse are not as well integrated as in standard inscribed cross churches. Documentary evidence indicates that the church may have been built in the late 8th century, but the evidence is inconclusive[23].

3. The ruin of St. John's Church of the Pelekete Monastery near Zeytinbagi. Only enough remains to observe that it was an inscribed cross church similar in plan to the Fatih Camii, built of masonry typical of the 8th–9th

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[21] H. Buchwald, The Church of the Archangels, 57–59, for a review of the evidence.

[22] I first proposed an early date and discussed the evidence in Sardis Church E – a Preliminary Report. *JÖB* 26 (1977) 290 fn 96; also idem, Western Asia Minor as a Generator of Architectural Forms in the Byzantine Period, Provincial Back-wash or Dynamic Center of Production? *JÖB* 34 (1984) 224. For description, illustrations, sources and further references, T. F. Matthews, The Byzantine Churches of Istanbul. University Park 1976, 158ff.; W. Müller-Wiener, Bildlexikon zur Topographie Istanbuls. Tübingen 1977, 144ff.

[23] F. W. Hasluck, Bithynica. *ABSA* 13 (1906-7) 285–291; H. Buchwald, The Church of the Archangels, 55ff.; idem, Western Asia Minor as a Generator of Architectural Forms. *JÖB* 34 (1984) 225, fig. 12, 13 for stylistic criteria and analysis; C. Mango, I. Ševčenko, Some Churches and Monasteries on the Southern Shore of the Sea of Marmara. *DOP* 27 (1973) 235–238, for a discussion of the inconclusive documentary evidence for identifying and dating the building and further illustrations.

centuries (and of other periods). The apse window solution is similar to that of St. John's in Trullo. Documentary evidence indicates that the church could have been built in the 8th century, but it could also have been rebuilt at any time, and the extant lateral walls are, in part, products of a 19th century reconstruction[24].

4. The ruin of Church H in Side in Pamphilia. The remains clearly permit its reconstruction as an inscribed cross church. The lack of exterior articulation and of exedrae flanking the major apse indicate an early date[25]. Elsewhere in Asia Minor flanking chapels with exedrae were omitted in late 6th, but included in 7th century church plans[26]. They seem to be common by the 8th century[27], and were used almost universally in inscribed cross churches. Church H may be the earliest inscribed cross church now known and could have been built in the late 6th century or the 7th. However, while the lack of flanking exedrae makes an early date *likely*, it does not constitute *proof*, because evidence concerning buildings of the period is, on the whole, too tenuous. Two other inscribed cross churches in Side may also have been constructed before the 10th century, but the evidence is less conclusive[28].

As these examples indicate, the currently available chronological evidence for early inscribed cross churches is anything but firm. The type

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[24] F. W. Hasluck, Bithynica, 293; C. Mango, I. Ševčenko, Some Churches and Monasteries, 242–248, for descriptions, sources, illustrations and a discussion of the documentary evidence; H. Buchwald, Western Asia Minor as a Generator of Architectural Forms. *JÖB* 34 (1984), figs. 14–16 for photographs taken during my first visit to the site in 1965, when the building was somewhat better preserved than in the illustrations in Mango and Ševčenko.

[25] S. Eyice, L' église cruciforme byzantine de Side en Pamphylie. *Anatolia* 3 (1958) 35–42; V. Ruggieri, Byzantine Religious Architecture (582–867): its History and Structural Elements (*OCA* 237). Rome 1991, 242, ill. 32, 33, pl. 20, with further references; H. Buchwald, Western Asia Minor as a Generator of Architectural Forms. *JÖB* 34 (1984) 226, fig. 21–22, for stylistic criteria and analysis.

[26] W. Müller-Wiener, Die große Kirche (sog. Bischofskirche) in Milet. *IstMitt* 23/4 (1973/4) 131–134; idem, Milet 1973–1975. *IstMitt* 27–28 (1977–78) 94–103. The examples in Miletus, both basilicas, are of particular interest because both are located in the same city and were presumably constructed within the same building tradition.

[27] H. Buchwald, The Church of the Archangels 54f., for examples, which include the *Koimesis* in Iznik, St. Sophia in Salonica and the Domed Church of St. Mary in Ephesus.

[28] H. Buchwald, Western Asia Minor as a Generator of Architectural Forms. *JÖB* 34 (1984) 226, fig. 17–20, 23–24, with further references. Chapel VI was built between preexisting walls and only the ruined eastern part, with its circular apse, the interior supports, and vaulting fragments found in the debris seem to belong to the inscribed cross church. The church built into the Southwest Basilica was constructed in two phases both in the inscribed cross form; its simple facade arcading could be an early variant of the rich exterior articulation typical of many churches in the 11th and 12th centuries.

appears certainly to have been used by the 9th century. It could, but need not necessarily have been invented in the late 6th century, and may have been conceived in the 7th, 8th or possibly the 9th.

* * *

Based upon the evidence presented above, the following further observations should be considered:

1. The forms discussed above need not be placed into developmental sequences. They may have been conceived to satisfy functional or other requirements with little concern for earlier architectural compositions. Or they may have been invented at random. In either case there would be no *transitional* architecture. However, considering the buildings of most periods which are better known than those of the Byzantine "Dark Age", it is difficult for me to believe that Byzantine architects created new forms without first taking a very close look at what other architects, and perhaps they themselves, had built earlier. Usually architects imitated the forms they knew, and changed them, most often cautiously and with specific goals in mind. Seen retrospectively, those changes resulted in *development* and *transition.*

2. In our attempt to find buildings which may have inspired the inception of the inscribed cross church, we should distinguish between those which may have been built immediately before, and those constructed much earlier. If the forms were used immediately before, then the architect may have created the new forms based upon his experience with, and understanding of forms which he knew well, because he himself, or other architects known to him had designed them. On the other hand, if the forms were used only much earlier, then the new forms were probably created with a retrospective, more distant attitude. In either case his contribution may be understood as an attempt to improve upon the forms he observed, and (or) as a reaction against them.

3. The first inscribed cross church could well have been inspired by cross domed basilicas, which have some similar features and are more similar than other earlier churches. The earliest cross domed basilicas were probably built in the 6th century, before the first inscribed cross churches, and certainly long before inscribed cross churches became common.

4. Current chronological evidence, as tenuous as it is, permits the possibility, that the inscribed cross church was created in the immediate tradition of cross domed basilicas. There is no reason to believe that there was a lapse of time between the use of the two church types; rather, both appear to have been used contemporaneously at least during some periods.

The existence of cross domed basilicas after the inception of inscribed cross churches does not negate this possibility, for the advantages of the inscribed cross church, which made it the preferred type after the 9th century, need not have been universally recognized immediately. Those advantages which were related to the monumental display of sacred images would not have mattered before the end of iconoclasm in 843.

5. As noted above, the wide lateral arches of inscribed cross churches were more similar to those of cross domed basilicas with inscribed aisles than to those of other cross domed basilicas. Inscribed aisles do not appear to have been used before the reconstruction of St. Irene after 740. Two quite different interpretations may be drawn from these observations: a) That the inscribed cross church was inspired by the cross domed basilica with inscribed aisles, and was therefore invented no earlier than about 740; b) That both church types represent alternative solutions to common design concerns. The early features of Side Church H make the second interpretation more appealing.

6. If architects wanted to widen the lateral arches of cross domed basilicas, presumably to emphasize the crossarms of the church, then they would have had to widen the piers which carry these arches, with the unfortunate result that the aisles would be quite remote from the naos. Both the cross domed basilica with inscribed aisles and the inscribed cross church provided solutions to this problem. In the former the aisles were relocated underneath the lateral arches, and in the latter they were omitted. While omission of the aisles presupposes that they were no longer needed, their retention in cross domed churches with inscribed aisles could have been due to tradition, rather than functional necessity. On the other hand, the two solutions were not equally successful: the inscribed aisles cluttered the cross arms, made them ambiguous, and failed to achieve the sense of clarity and unity found in inscribed cross churches.

7. Usually, in cross domed basilicas, three arches separated by two pillars are located between the naos and the aisles on the lateral axis of the dome. In most early inscribed cross churches a similar arrangement is located at the ends of the lateral cross arms, also on the lateral axis of the dome. This observation appears to support the hypothesis that the inscribed cross church was, initially, a mutated variant of the cross domed basilica, in which the aisles were omitted.

XI

THE GEOMETRY OF MIDDLE BYZANTINE CHURCHES AND SOME POSSIBLE IMPLICATIONS

With six plates

To the Memory of Otto Demus

The purpose of this paper is to explore the use of geometry in Middle Byzantine architecture and why it may have been employed. Its emphasis is upon the interpretation of evidence provided by the monuments, rather than upon the written sources; perhaps others will approach the ideas presented here with more emphasis upon textual evidence, which may provide additional arguments and insights. Many of the examples presented were published elsewhere, but not in the same context. Because of its broad scope this paper may be of interest to historians or theorists of architecture with little previous knowledge of Byzantine buildings, and I have therefore described some of the material in greater detail than would otherwise be necessary. Even though much of the evidence is open to other interpretations, I hope that the thoughts presented will be of interest, and that they will lead to further study.

Geometry as used in this investigation is defined as simple, regular, stereometric, easily recognized two and three dimensional configurations such as circles, squares, triangles, regular polygons, regular star shapes, spirals, spheres, cylinders, cones, cubes, and rectangular prisms.

Three different applications of geometry to architecture may be distinguished: 1. the use of geometry in secondary forms and decorative details; 2. the use of geometry in an underlying scheme which controls the locations of important architectural features; 3. the use of geometry to define the primary architectural forms of the building. Primary architectural features articulate space and determine the basic forms of the building; secondary features usually articulate surfaces and modify the primary forms.

These applications are not mutually exclusive, and all may be used in the design of a single building. While they may not always be neatly distinguishable in architectural examples, the concept of three distinctive applications of geometry in architecture is particularly useful, I believe, in clarifying significant characteristics of Middle Byzantine churches.

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1. The Use of Geometry in Secondary Features

While primary and secondary architectural forms are closely linked and frequently inseparable, the geometry which defines them may differ decisively. The distinction may be demonstrated in the vaulting solution of the Pantheon in Rome. The primary form is the dome, and the coffers which articulate its surface are secondary features. While the dome is spherical, the shape of the coffers is based upon a square distorted to adjust it to the form of the dome. The ribs of Late Gothic vaults provide further examples of the use of geometry in secondary architectural features. Usually the geometry used in their design is immediately apparent, in spite of the decorative details; as with the coffers of the Pantheon, their geometric forms are attuned to, but not the same as those of the vaults to which they are applied.

Within our context the Roman and Late Gothic examples are striking because they demonstrate, by way of contrast, the very limited emphasis upon secondary architectural features in Middle Byzantine churches[1]; nothing comparable to the coffers of the Pantheon or the ribbing of Late Gothic vaults may be discerned. Except for doors and windows, stringlines, marble revetment, floor patterns, and column capitals there usually are no secondary architectural features in Middle Byzantine churches. The deemphasis of secondary features is significant for the architecture and for the geometry of these buildings.

On the other hand, numerous geometric figures were carved on the surfaces of church furnishings, including lintels, door and window frames, capitals, and closure slabs (Figs. 1–8). Unlike the coffers of the Pantheon and ribs of Late Gothic churches, these members were not integral components of the architecture and could be removed without changing the architectural form of the building. Often they were interchangeable from church to church, and frequently they were reused spoils, retrofitted for new locations. Geometric forms were carved only occasionally on capitals and frames of doorways or windows, but almost universally on the altar screens which separated the presbytery from the nave and aisles.

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[1] In H. Buchwald, Western Asia Minor as a Generator of Architectural Forms in the Byzantine Period, Provincial Back-wash or Dynamic Center of Production? *JÖB* 34 (1984) 199–234; *idem*, Der Stilbegriff in der byzantinischen Architektur. *JÖB* 36 (1986) 303–316 I presented reasons why the usual designations for Byzantine stylistic currents are inadequate for architecture. However, because the designations proposed in these articles are not yet generally known I use the term *Middle Byzantine* in this investigation, describing a historic period rather than an architectural style. It is roughly equivalent with *Style III* which, however, begins before iconoclasm.

The decorative repertoire of Middle Byzantine carved marble church furnishings included a rich variety of geometric figures, such as circles, rosettes, quatrefoils, spirals, squares, triangles, hexagons, octagons, rhombuses, star shapes, knot forms, and crosses[2]. The forms are usually carved in flat relief and the geometry is direct and easily comprehended. Frequently it takes the form of interweave, or knotted strapwork with one, two, or three strains.

Four variations may be distinguished in the application of geometry to carved marble furnishings: 1. the geometric figure is an independent component used as the central feature of the composition; 2. geometric figures, often in multiples, decorate an entire surface; 3. a geometric system forms the framework for decorative features such as animals, vegetal motifs, or other geometric configurations; 4. geometric figures are dispersed, with other motifs, throughout the composition. Often geometric figures are combined using one or more of the following techniques: 1. additive repetition; 2. juxtaposition; 3. organization about a common center; 4. disposition within a common axial or multi-axial system.

Geometric motifs were also used in brick decoration which appeared on the facades of some Middle Byzantine churches, initially in the 11th or 12th century (Fig. 9); in the subsequent period it was used extensively in Constantinople, Greece, Asia Minor, and the southern Balkans (Fig. 23)[3]. The geometric figures include various forms of meanders, chevrons, checker-

[2] I know of no comprehensive investigation of Middle Byzantine carved ornamentation. A. Grabar, Sculptures byzantines du moyen âge II (XI–XIV siecle). Paris 1976 *passim* for an analytic review of some of the material; other examples may be found in T. Ulbert, Studien zur dekorativen Reliefplastik des östlichen Mittelmeerraumes (*MBM* 10). Munich 1968 (Diss. Freiburg i. B. 1966); C. Delvoye, Cancelli. *RbK* 1 (1966) 900–931; B. Brenk, Byzantinische Marmorschranken in amerikanischen Museen. *Institutum Norvegiae. Acta ad archaeologiam et artium historiam pertinentia* 8 (1978) 87f.; numerous excavation, restauration, and travel accounts concerning buildings and sites in Asia Minor, Greece, Istanbul, and the southern Balkans contain illustrations or descriptions of carved marble furnishings with geometric motifs.

[3] While much has been done recently to fill the lacuna in our understanding of this decorative technique, there is still no comprehensive account of its development throughout the Byzantine region. For recent investigations, usually concentrated geographically to relatively small areas or to specific motifs, see: M. Velenis, Ἑρμηνεία τοῦ ἐξωτερικοῦ διακόσμου στὴ βυζαντινὴ ἀρχιτεκτονική. Salonica 1984, for the most extensive account of the technique published to date; A. H. S. Megaw, Byzantine Reticulate Revetments, in: Χαριστήριον εἰς A. K. Ὀρλάνδον 3. Athens 1966, 10–22; H. Buchwald, Lascarid Architecture. *JÖB* 28 (1979) 262–296; *idem*, Sardis Church E – a Preliminary Report. *JÖB* 26 (1977) 265–299; A. Pasadaios, Ὁ κεραμοπλαστικὸς διάκοσμος τῶν βυζαντινῶν κτιρίων τῆς Κωνσταντινουπόλεως. Athens 1973, 5ff. for an exemplary collection of brick ornamentation in Constantinople.

boards, triangles, lozenges, herringbone and basketweave patterns, roundels, concentric arches, heart shapes and quatrefoils. They are usually developed as rhythmic directional friezes or as surface patterns; their modular geometry depends, for its visual effect, upon the regular juxtapositioning of bricks or tiles with plaster or small marble plaques.

There is a striking difference in the character and configuration of the geometry used on the exterior of Middle Byzantine churches and that used inside the buildings. It may be explained only in part by the differences in scale and media, stone carving on the interior and brick or tilework on the exterior. The essential difference is that on the exterior the geometric configurations are integral with the walls which define the building, while on the interior they are limited to removable church furnishings. However, brick ornamentation is by no means used universally in Middle Byzantine churches, and before the 13th century it is not an important aspect of the exterior solution. Both the brick decoration and the carving are extraneous to the major forms of the buildings and could, in most examples, be omitted without noticeably changing the architectural impact[4].

2. The Use of Geometry as an Underlying Generating Form

Geometric constructions which generate the architectural forms of buildings have been proposed by architectural historians for numerous historic monuments. The use of such constructions is seldom based upon documentary evidence and is, for the most part, conjectural. Many proposed constructions are so complex that it is difficult to imagine their use in practice, particularly before the development of sophisticated drafting equipment; others fail to define significant architectural features and their application is therefore doubtful. Nevertheless, in some examples geometry as an underlying generating form appears to be convincing, even though the evidence may be open to various interpretations.

A case in point is the Pantheon in Rome. The underlying geometry which appears to generate the form of its interior is a sphere resting in the center of its floor which defines the inner face of the dome; the major interior cornice is, apparently, located on the horizontal great circle of the sphere. When standing in the Pantheon the sphere is not immediately apparent, because perspective vision does not permit an accurate judgement of true dimensions, and because the coffers of the dome tend to distort the visual

[4] After the fall of Constantinople to the 4th crusade in 1204, a number of churches were constructed in various locations in which the brick ornamentation is an essential part of the facade articulation.

cohesion of the sphere. The lower half of the sphere must, at any rate, be imagined and is not confirmed by documentary evidence. The building could have been designed by constructing the interior height of the rotunda walls equal to the radius of the dome without the conceptual construct of the sphere.

Two types of geometric constructions appear to have been used to define the locations of important features in the design of some Byzantine buildings: 1. combinations of squares, their diagonals, and segments of circles; 2. modular grids.

The two types cannot always be neatly distinguished. Elsewhere I have suggested, for instance, that the plan of Church E in Sardis, probably constructed about 1230–1245, was controlled by a geometric configuration known as the *quadratura*[5]. The *quadratura* is a method of relating the dimensions of building parts to each other using a system of diagonally inscribed squares. The intriguing aspect of the *quadratura* is that any chosen dimension may be related to other dimensions in a continuum which quickly reaches, at one end, the infinitesimal, and at the other, infinity. It is known primarily in Western medieval architecture, and appears in the 13th century sketchbook of Villard d'Honnecourt and the late 15th century treatise on the construction of Gothic finials by Matthias Roriczer.

According to the proposed construction, the basic unit of the *quadratura* in Church E is a square which defines the locations of the four columns underneath its major dome. This square is diagonally inscribed into a larger square with its corners at the inner faces of the western, northern, and southern walls of the naos. This square, in turn, is diagonally inscribed into a still larger square which defines the outer edges of the nine central bays of the naos. Finally, the eastern and western corners of an even larger square, into which this square is diagonally inscribed, appear to determine the locations of the inner faces of the major apse and the west wall of the narthex.

The *quadratura* appears to have been applied in a very similar manner to the following churches: the 10th and 11th century buildings now known as Bodrum Camii and Kilise Camii in Constantinople[6]; the Church of the Virgin *Hodegetria* in the *Brontochion* Monastery in Mistra, built in the early

[5] H. Buchwald, Lascarid Architecture. *JÖB* 28 (1979) 262–296; *idem*, Sardis Church E – a Preliminary Report. *JÖB* 26 (1977) 265–299 for discussion, illustrations, and further references, also for the Western medieval sources.

[6] T. F. Matthews, The Byzantine Churches of Istanbul. University Park 1976, 209ff., 386ff.; C. L. Striker, The Myrelaion (Bodrum Camii) in Istanbul. Princeton, N. J. 1981, both with references to earlier publications, discussion and illustrations.

13th century[7]; the Church of St. John *Aleiturgitus* in Nessebar (Mesembria) which has been attributed to the late 13th or to the first half of the 14th century[8]; the Church of the Virgin *Pantanassa* in Mistra, dedicated 1428[9]. While the floor plan was measured with surveying instruments at Sardis, the use of the *quadratura* was determined in the other churches using published plans which may include inaccuracies. Minor dimensional discrepancies may be neglected because of the irregularities typical in Middle Byzantine buildings. It is striking, nevertheless, that when examining most published plans of similar churches the use of the *quadratura* may immediately be excluded, while in the plans of the churches listed above all features appear to fall into place immediately.

Expressed numerically, the *quadratura* relates dimensions in the proportion 1:2. Each square is either half or double the size of the next parallel square. The diagonally inserted squares have sides related to those of the next larger square as $1:\sqrt{2}$, but they are not used as architectural dimensions. These church plans may therefore have been regulated by a modular grid in which the basic unit is a square with one side equal to half the distance between the column axes, rather than by the *quadratura*.

Indeed, the churches could have been designed without the use of either geometric construction by relating the floor plan dimensions in the proportions 1:1 and 1:2, although that procedure implies a modular grid conceptually, whether or not the gridlines were actually constructed. However, the modular grid system, with its repetitive character, has little relevance to inscribed cross churches, while the *quadratura* scheme is focused upon their central feature, the dome over four columns; the church forms develop outward from the central dome much as the squares develop outward in the *quadratura*. The use of the *quadratura* appears, therefore, to be more appropriate to inscribed cross churches than a modular grid.

The same proportional scheme, whether *quadratura* or modular, may have been applied to the churches listed above also to control their vertical dimensions. In those churches which are relatively well preserved, the width of the church interior appears to be equal to the height of the major stringline underneath the dome. In some examples the width of the nave

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[7] G. MILLET, Monuments byzantins de Mistra. Paris 1910, 23ff.; M. CHATZIDAKIS, Mistras. Athens 1948, 55ff.; H. HALLENSLEBEN, Untersuchung zur Genesis und Typologie des "Mystratypus". *Marburger Jahrbuch für Kunstgeschichte* 18 (1966) 105ff.; S. DUFRENNE, Les programmes iconographiques des églises byzantines de Mistra. Paris 1970, 8ff., for a thorough review of the dating and a repudiation of the attempt to date the church "about 1308".

[8] A. RACHENOV, Eglises de Mesembria. Sofia 1932, 36ff.

[9] G. MILLET, *ibid.* 35ff.; M. CHATZIDAKIS, *ibid.* 85ff.; S. DUFRENNE, *ibid.* 9ff.

appears to be equal to the height of the stringline above the columns, and in others the stringline under the major barrel vaults is at midheight between the stringline over the columns and the apices of the major barrel vaults. Also, the distance from the center of the church to the apse, and to the narthex west wall appears to be equal to the height between the stringline over the nave columns and the apex of the major dome.

In transverse section, therefore, the church interior, without the dome, may be controlled by a square into which a smaller square is diagonally inscribed which controls the width of the nave and the heights of major stringlines (Fig. 11). In longitudinal section the larger square of the transverse section is inscribed diagonally into a still larger square with its corners at the apex of the dome and at the eastern and western extremities of the church (Fig. 12).

If the *quadratura* of the transverse section is combined with that of the longitudinal section, it may be understood as a three dimensional system of diagonally inscribed cubes rather than a two dimensional system of squares. The church interior, without the dome, may also be inscribed into two cubes which meet underneath the major dome. Our word of caution, however, concerning possible inaccuracies in published plans must be underlined for published sections, because: 1. it is more difficult to measure vertical dimensions without good surveying instruments; 2. vertical dimensions are more likely to be distorted by structural deformation; 3. original floor levels are often difficult to establish.

In contrast to the *quadratura*, geometric constructions which are based upon irrational numerical relationships are not interchangeable with modular grid systems. In a previous investigation I suggested that such constructions were used in a group of churches probably constructed during the Lascarid period between about 1230 and 1265, including Latmos Churches 4 and 8 at Ikis Ada and Kaiwe Asar Adasi, the Church of the Virgin at Sikelia, and the Church of St. John the Baptist at Chalkios, both on Chios[10]. Other examples may, of course, exist.

Constructions used in these four churches include $1{:}\sqrt{2}$, $1{:}\sqrt{3}$, and $1{:}1 + \sqrt{2}$. The construction of each geometric figure may be performed simply and with ease, presumably while laying out the plan of the church at full scale on the building site (Fig. 13). Neither sophisticated equipment nor mathematics, but only one person, a rope, and wooden stakes are required. First a square is constructed; then its diagnonal, which is related to its side as

[10] For illustration, discussion, chronology and further references H. Buchwald, Lascarid Architecture. *JÖB* 28 (1979) 262–296.

$1{:}\sqrt{2}$, is transposed as an arc either from the near or the far corner to obtain a rectangle with its sides related either $1{:}\sqrt{2}$ or $1{:}1 + \sqrt{2}$. To obtain a rectangle with its sides proportioned $1{:}\sqrt{3}$, the diagonal of a rectangle with its sides proportioned $1{:}\sqrt{2}$ is transposed onto one of its long sides.

The incommensurable relationships which are obtained with these constructions are used as a descriptive designation. The medieval builders could have used the constructions without knowing the mathematical relationships, although they were understood already in Antiquity[11].

Square root rectangles appear to have controlled exterior dimensions, in contrast to the *quadratura*, which seems to have controlled interior measurements. Only in Latmos Church 8 is a major interior dimension, the length of the naos, apparently controlled by the geometric construction. While the narthex of Latmos Church 4, which is included in the proposed geometric construction $1{:}\sqrt{3}$, was a later addition, it may have been planned at the same time as the main body of the church.

The applicability of the proposed square root constructions to Lascarid church plans could be fortuitous. Although it is not possible to prove that geometric constructions were actually applied in the design of the churches, the following observations support that assumption: 1. the geometric constructions are easy to perform; 2. they are very similar; 3. the churches were constructed during roughly the same period within a relatively restricted geographic area, implying that the use of geometric constructions had a common impetus.

As mentioned above, even though modular grids can be applied to some Middle Byzantine churches, their complex centralized plans, which will be described in greater detail below, are not well adapted to design methods based upon modular spacial conceptions. On the other hand, most features of Early Byzantine basilical churches are repetitive, and therefore lend themselves well to the use of modular planning grids. Byzantine geometric design systems may therefore be placed in greater focus by a brief digression concerning earlier examples.

Modular grids appear to have been used in the design of a number of Early Byzantine basilicas. Architectural features with dimensions probably controlled by a modular grid include the nave (usually without the apse), the aisles, the nave and aisles together, and, at times, the narthex and other features. As stated above, while these basilicas could have been planned using major dimensions reducable to numeric ratios without a grid, their

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[11] G. J. Allman, Greek Geometry from Thales to Euclid. New York 1976, *passim*.

design conceptually presupposes a modular grid, whether or not it was actually constructed.

A few examples will suffice to illustrate how the modular grids and proportional ratios were used. In Church EA at Sardis (Fig. 10) the nave is proportioned width to length as 1:3, the aisles as 1:6, the narthex as 1:4, the nave and aisles together as 2:3; the width of the nave is to the width of the aisles as 1:2 (all dimensions here are to the axes of walls or columns)[12]. Other churches which appear to have been designed using the same or very similar modular schemes include Church No. 1 at Ayatekla (Meriamlik)[13], Column Church No. 1 at Pamukkale (Hierapolis in Phrygia)[14], the Church South of the Gymnasium in Assos[15], S. Apollinare in Classe near Ravenna[16], the Basilica of Euphrasius in Poreč (Parenzo)[17], and five basilicas in northern central Syria[18].

A modular grid may also have been used to control vertical dimensions, although most early Byzantine churches are too poorly preserved to be certain. In S. Apollinare in Classe the ratio width to height of the nave (measured to the tops of the clerestory walls) appears to be 3:4[19]; in the Studius basilica in Istanbul that ratio is very close to 1:1[20]. The ratio

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[12] H. Buchwald, The Churches of Sardis. *Archaeological Exploration of Sardis*, Cambridge MA, Manuscript in publication.

[13] E. Herzfeld, S. Guyer, Meriamlik und Korykos. *Monumenta Asiae Minoris Antiqua* 2. Manchester 1930, 4–46; H. Hellenkemper, Kommagene – Kilikien – Isaurien. *RbK* 4 (1990) 210–212, with a summary of recent scholarship. The site formerly known as *Meriamlik* is now known as *Ayatekla*.

[14] P. Verzone, Le Campagne 1960 e 1961 a Hierapolis di Frigia. *Annuario della Scuola Archeologica di Atene* XXXIX–XL n.s. 23–24 (1961–1962) 639–641; *idem*, Hierapolis. *RbK* 2 (1967) 1220f.; *idem*, Hierapolis cristiana. *12. Corso di Cultura sull'Arte Ravennate e Bizantina* (1965) 624–627.

[15] J. Clark, F. Bacon, R. Koldewey, Investigations at Assos. Cambridge, London, Leipzig 1902, 183–187.

[16] F. W. Deichmann, Ravenna, Geschichte und Monumente. Wiesbaden 1969, 235–261; *idem*, Zu den Proportionen der Grundrisse einiger ravennatischer Basiliken. *Römische Quartalschrift* 57 (1962) 446f.; P. Mazzotti, La basilica di Sant' Apollinare in Classe. Vatican City 1954; *idem*, S. Apollinare in Classe, indagini e studi degli ultimi trentánni. *Rivista di archeologia cristiana* 62/1–2 (1986) 199–219; G. Cortesi, Classe paleocristiana e paleobizantina. Ravenna 1980, 39–86.

[17] M. Prelog, Poreč. Belgrade 1957; B. Molajoli, La Basilica eufrasiana di Parenzo. Padua 1943; W. Gerber, Altchristliche Kultbauten Istriens und Dalmatiens. Dresden 1912; A. Terry, The Sculpture at the Cathedral of Eufrasius in Poreč. *DOP* 42 (1988) 13–64 with illustrations and further references.

[18] H. C. Butler, Architecture and other Arts. New York–London 1904, 34–36.

[19] See fn 16 above.

[20] A. van Millingen, Byzantine Churches in Constantinople. London 1912, fig. 14, 15;

between the column height and the intercolumniation is 1:1 in the church built into the Temple of Apollo at Didyma[21] and in the Great Church at Miletus[22].

While many other churches could be cited with similar or other proportional relationships, it should be noted that in numerous basilican churches of the same period no similar modular system is evident. With the exception of Church EA in Sardis all dimensions were taken from published plans or text, and caution concerning possible inaccuracies must be stressed.

In the cited examples the modular grids are apparently not used in a random fashion, but rather, to proportion the dimensions of all major features of the building according to the first four numeric ratios of the harmonic musical scale, 1:2:3:4. The method may be observed in S. Apollinare in Classe, one of the best preserved churches of the period. 1:2 is apparently used as the ratio between the width of the aisles and that of the nave; 1:3 is the ratio between the width and length of the nave; 1:4, the ratio between the width and length of the narthex; 2:3, the ratio between the width and length of nave and aisles together; 3:4, the ratio between the width and height of the nave. Each ratio may be seen as part of a closed and complete system in which all of the proportional relationships possible within the harmonic series 1:2:3:4 are exhausted.

3. Geometry as a Primary Architectural Form – the Inscribed Cross Church

Every architectural form may be described in geometric terms. However, examples in which clear, simple, regular, stereometric forms such as spheres, cylinders, and rectilinear prisms dominate are limited throughout architectural history. Examples include the pyramids of ancient Egypt; some early Renaissance architecture; designs by Ledoux and his followers in the late 18th century; most Modern architecture of the 1920's.

However, in most periods the dominant use of clearly expressed stereometric geometry was limited to relatively few examples or to a brief time span. Frequently the geometry of the architecture was cloaked by

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T. F. Matthews, The Early Churches of Constantinople. University Park 1971, 19–27; *idem*, The Byzantine Churches of Istanbul. University Park 1976, 143–158 for additional illustrations and references; C. Mango, The Date of the Studius Basilica in Istanbul. *BMGS* 4 (1978) 115 for the date.

[21] H. Knackfuss, Das Heiligtum nach dem Aufhören der Arbeiten am Tempelbau, in: Didyma, T. Wiegand, ed. Berlin 1941, 29–41, pl. 3–4.

[22] W. Müller-Wiener, Die große Kirche (sog. Bischofskirche) in Milet. *IstMitt* 23–24 (1973–4) 131ff.; *idem*, Milet 1973–1975. *ibid*, 27–28 (1977–78) 94–103.

secondary details and ornamentation which prevented direct comprehension. In the Middle Byzantine period, on the other hand, the use of stereometric geometry as the clear and primary architectural form was consistently the dominating characteristic of most church buildings for many centuries.

The inscribed cross church, the most prominent Byzantine church type during the period spanning, probably, from the 9th century to the 12th, provides a good example[23]. Its features are complex, but easily grasped when experienced from inside the building. Its lower perimeter walls (without the narthex) usually contain a simple rectangular space, the longer axis oriented east-west, with one or more exedral apses projecting to the east. The vaulting solution gives the church its distinctive form and most prominent characteristics. At or near the church center a dome is supported by a drum which rests upon four pendentives and four barrel vaults (Fig. 14–17). The pendentives provide the transition between the drum and the barrel vaults, which are disposed in the form of a cross with the dome at its center. The barrel vaults have approximately the same diameter as the dome, and continue in the four primary directions to the perimeter walls of the church. The eastern barrel vault is closed at the east by the exedral vault of the major apse. The barrel vaults rest upon clerestory walls which meet the exterior walls at right angles. Parts of the clerestory walls are carried by arches supported at one end, underneath the dome, by capitals or imposts on columns or, occasionally, on piers. The four corner spaces between the barrel vaults and the exterior walls are covered either by smaller, lower barrel, groined or domical vaults or, more rarely, by domes on pendentives, occasionally with drums.

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[23] I continue to use the term *inscribed cross* church type because it is simple and describes distinctive features more effectively than the other designations which have been suggested. *Cross-in-square* fails to take into account that most of these churches are not square in plan. *Quincunx* refers to a scheme with five objects in a square or rectangle, one in the center and one in each corner, an arrangement which is descriptive of only a limited number of the buildings, those with domes in the corner bays. *Four column* type can be misleading because there may be two or six columns, or piers without changing the architectural configuration; the number of columns is not an essential feature of these churches. While in German *Kreuzkuppelkirche* has become the standard term for this church type, its translation, *cross-dome* church, is more appropriate to domed churches with a cruciform plan such as San Marco in Venice or the Church of the Virgin at Tomarza. C. Mango, Byzantine Architecture. Milan 1978; 1st paperback ed. London 1986, 108–118 and *passim* for examples and further discussion; also H. Buchwald, Western Asia Minor as a Generator of Architectural Forms in the Byzantine Period, Provincial Back-wash or Dynamic Center of Production? *JÖB* 34, 199–234 for early examples in Asia Minor.

The subtle transition between the complexity of the vaulting and the simple clarity of the lower zone, on the one hand, and the strong contrast between the upper and lower levels of the building on the other provide a sense of tension when experiencing these churches which undoubtedly contributed to their success. That success may be measured today by personal experience, but also by the observation that the inscribed cross church type dominated Byzantine ecclesiastic construction for several centuries, and appears to have had a profound influence on Western medieval church architecture. After the aisled basilica, the inscribed cross was the most prominent Byzantine church type.

Numerous variants of the inscribed cross plan were developed. In some churches the side aisles were abbreviated or only indicated by shallow arches. In one group of buildings in Greece barrel vaults were substituted for the central domes[24]. In the most important variant the central dome was expanded at the expense of the crossarms, which were not necessarily covered by barrel vaults; occasionally provided with galleries, it lacks free standing interior supports, and its pendentives were formed of a sphere cut vertically on eight, rather than the usual four sides[25]. In all variants the basic form, a cross inscribed in a rectangle, was maintained.

The geometry of these churches is clear, simple, and immediately apparent. The dome is usually a hemisphere, the conch of the apse a quarter sphere, the drum a cylinder; barrel vaults and the walls of the apse are half cylinders; groined vaults are two half cylinders which intersect at right angles. Pendentives are hemispheres which have been cut away horizontally at the top and vertically in each cardinal direction, leaving four spherical triangles[26]. Arches are narrow half cylinders. Occasionally domes or other vaults were built in an elliptical form, but for the most part vaults which are not circular were constructed with the lack of precision typical of Middle Byzantine buildings or structurally deformed after completion.

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[24] A. K. ORLANDOS, Οἱ σταυρεπίστεγοι ναοὶ τῆς Ἑλλάδος. *ABME* 1 (1935) 41–52.

[25] C. MANGO, *ibid.* 120–128 and *passim* for examples, further discussion and references; also R. KRAUTHEIMER, Early Christian and Byzantine Architecture (*Pelican History of Art*). Harmondsworth 1965, rev. 1975, 356–359 and *passim*; I know of no adequate term for this variant. *Octagon-domed* church type (KRAUTHEIMER *ibid.* 356) refers only to the central component and may be used to describe numerous churches with entirely different floor plans; *Greek-cross-octagon* plan type (KRAUTHEIMER *ibid.* 357 f.) is equally misleading because the Greek cross, with all arms equal in length, was used in various inscribed cross variants and in other churches; the term *octagon* is also misleading because it refers only to the pendentive zone of the central core of the building rather than to essential features.

[26] Examples of pendentives formed by cutting away six or eight sides of the hemisphere also exist, but are not as common.

The clarity of the geometry is particularly apparent because the use of secondary architectural features is limited. Simple, thin, usually undecorated stringcourses are almost standard. Their profiles are neither richly curved nor Classical, but rather, geometric; the most common has a flat or slightly curved face which slopes diagonally toward the wall below. The stringcourses underscore the geometry of the architectural features by clearly separating the individual forms. A major, continuous stringcourse usually divides the pendentives, major barrel vaults, and conch of the apse from the vertical walls and secondary vaults which support them. Another stringcourse separates the drum of the major dome from the vaults below (Fig. 14). The major stringcourses therefore divide the building into three horizontal zones: 1. vertical walls and lower, secondary vaults; 2. pendentives, major barrel vaults, and conch of the apse; 3. central dome together with its drum.

Windows and doors are the only secondary architectural features of a typical church interior except for stringcourses, capitals, and church furnishings. Their forms are based upon the simple, clear geometry which underlies the primary features of the building. Windows and doors are not emphasized by framing with profiles, columns, pilasters, gables, or other details common in Classical, Romanesque or Gothic buildings. Usually windows have simple rectangular sills and sides, and arched soffits. Typically the window appears to be the *absence of wall*, as if it had been cut out of the wall surface with a sharp knife. Most windows are located in the walls below the vaults and therefore do not break the geometric integrity of the vaulting zone; the rhythm of the windows in the drum of the major dome and in the apse serves to emphasize, rather than destroy their cylindrical surfaces. The forms of doorways, usually equally simple, are occasionally framed by carved marble members.

The small scale of Middle Byzantine churches contributes significantly to the immediate comprehension of their geometric forms[27]. Upon entering the church through the major door in the western wall, usually from a narthex, the full impact of the geometric configuration is grasped directly, without moving about to consider how the various parts relate to each other. The major dome, drum, pendentives, the conch of the apse, the cross formed by the four major barrel vaults, the four supporting columns and the

[27] Exceptions, such as San Marco in Venice, which are comparable in scale to major churches of the 4th–6th century are known only outside the central area of Byzantine civilisation. See p. 313 below and footnote 40 for further discussion of the scale of Middle Byzantine churches.

side aisles may be viewed from a single location. In striking contrast, the cruciform plan and many other important features of St. Mark's in Venice, which is very much larger and more complex, may be grasped only intellectually, "in the mind's eye", by piecing together numerous different views obtained while moving through the building.

An important reason for the direct comprehension of the geometry in a typical Middle Byzantine church is that the interior surfaces of the primary components, e.g. dome, drum, exedra, pendentives, barrel vaults are smooth: they are not articulated or decorated spacially in any manner. Each geometric component is viewed and considered by itself and in its relationship to other components without interference from secondary features such as coffers, ribs, fascias, architectural profiles, or added details.

On the other hand, while the walls and vaults of Middle Byzantine churches are not adorned with spacial features, they are never undecorated. Usually the vertical walls are sheathed in marble or painted marble imitation, while the vaults are decorated with figure representations in fresco or mosaic (Fig. 25, 26). However, the clarity of the architectural forms is not broken by the use of marble sheathing, frescoes and mosaics. To the contrary, marble sheathing produces crisp straight edges at corners which outline and enforce the rectilinear geometry of the lower zones, while the brilliant highlights of mosaics, and to a lesser extent of frescoes, emphasize and bring out the curved geometry of the vaulting zone[28]. Because of the polished, shimmering quality of marble, mosaic and, somewhat less, fresco perception of the architecture concentrates upon the surfaces of the geometric forms of which it is composed, while the mass of the walls of which the building is constructed is deemphasized, negated, and forgotten. With the choice of marble revetment, mosaic and fresco to sheath and decorate the interior surfaces of Middle Byzantine churches the perception of their interiors as a composition of precise stereometric geometry was assured. In addition to providing the *appearance* of precise stereometric geometry, with the use of these sheathing materials surfaces could be produced which *actually* were more precise in their geometry than could otherwise have been obtained with the rough brick, ashlar and rubbled mortar masonry, usually of reused material in poor condition, which were commonly used to construct these buildings.

The marble sheathing is usually applied as a continuous flat surface. If panelling is represented, it is with marble sheets in different colors set in the

[28] Fresco surfaces were usually very smooth and polished, providing a high degree of reflection almost comparable with that of mosaics.

same plane, separated by thin stringlines. The visual effect of color variations and of veining is exploited only in surface patterns. The marble sheathing serves to crisply define wall surfaces, in contrast to the spacial, structurally tectonic marble panel articulation found frequently in buildings of the Roman, Renaissance, or Baroque periods.

The style of middle Byzantine representation, and its relationship to the geometry of the architectural forms are discussed in a separate chapter below[29].

The forms of the church interior are reflected directly on the exterior of the building; every major exterior form envelopes a specific interior form. Facades designed independent of the interiors, such as those frequently found in Renaissance and Baroque churches, are unknown in the Middle Byzantine period. The dominant features of the interior e.g. dome, drum, cruciform dominate and define the exteriors of the churches (Fig. 19–21).

The clear and simple geometry of church interiors was typical of their exterior forms particularly during the early part of the Middle Byzantine period. The church now known as the Fatih Camii in Zeytinbagi (Tirilye, Trigleia) on the south coast of the Marmara, probably built in the 9th century, is a relatively well preserved example (Fig. 19)[30]. The drum of the dome stands above the building, cylindrical, with minimal articulation. The four pendentives are reflected as a low block, square in plan, underneath the drum. The cruciform of the major barrel vaults is clearly legible in the unfenestrated clerestory walls. All exterior walls appear to have been flat and unadorned. The windows are, apparently, unframed and seem to have been cut into the walls with the same incisiveness characteristic of openings inside the church.

By the 12th century exterior surfaces are usually articulated in a richer manner. While there are exceptions, recessed arcades articulate facades, emphasizing the structural, rather than the geometric character of the walls; windows are framed by recessed brick arcades, producing a play of shadows

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[29] See pp. 309–315 below for further discussion of the relationship between the church building and monumental figure representation.

[30] The name of the town was changed recently. Neither date nor dedication of the church are certain. F. W. Hasluck, Bithynica. *ABSA* 13 (1906) 285–291; H. Buchwald, The Church of the Archangels in Sige near Mudania. Vienna, Cologne, Graz 1969, 51, 55ff., fn. 238; *idem*, Western Asia Minor as a Generator of Architectural Forms in the Byzantine Period, Provincial Back-wash or Dynamic Center of Production? *JÖB* 34 (1984) 223–229, fig. 12, 13, 28; C. Mango, I. Ševčenko, Some Churches and Monasteries on the Southern Shore of the Sea of Marmara. *DOP* 27 (1973) 235–238, 273f., fig. 4–19; C. Mango, Byzantine Architecture. Paperback ed. 96–98, fig. 138–139, for descriptions, illustrations, and discussion of the building's dedication and date.

which tends to destroy the integrity of the geometry; pilasters or columns plastically modulate dome drums, now usually octagonal, hiding the edges of their facets (Fig. 22, 24). Exterior walls at times are decorated with carved spoils or with polychrome brick or ceramic decoration (Fig. 9, 23). While each of these features is usually composed of geometric components, in context they detract from the geometry which was so simple and clearly defined in earlier churches.

Structural logic is reflected but not emphasized in the geometry of the inscribed cross church. The support system emanates from the center, from the highest point of the building, and moves downward gradually to the lower, outer parts. The dome rests upon the drum; the drum is supported by the pendentives and major barrel vaults; these are supported by a system of secondary vaults, arches, walls, and the four central columns. Because of their prominent locations, the central columns appear to play a major role in the support system, even though most of the loads and thrusts are led through the vaulting to the outer walls of the building. Regardless of their actual structural functions, the columns reflect, and perhaps are meant to recall the *support* imagery of columns in the architecture of Antiquity and the Early Byzantine period.

The major forms of inscribed cross churches can be interpreted symbolically. Particularly relevant are the cupola as Dome of Heaven and the cruciform outlined by the four major barrel vaults. Other symbolic references include the church building as reflection of the cosmos, of the Holy Land, and of the Holy City Jerusalem[31].

At another level, inscribed cross churches may be understood as reflections of earlier building types. The basilica is echoed in the columns, usually crowned by reused earlier capitals, and in the subdivision of the building into a nave flanked by low, narrow side aisles. The rotunda is reflected in the dome, and the cruciform in the major barrel vaults. In the inscribed cross church these building types, each sanctified by time and common in the Early Byzantine period were amalgamated into a single complex but harmonious, comprehensible architectural statement.

The process of amalgamation evident in the design of Middle Byzantine buildings can be understood as a reflection of Middle Byzantine civilization in the broadest sense: after iconoclasm numerous earlier cultural and theological strains were congealed into a complex but relatively homogenous, harmonious unit. We will probably never know whether this subtle parallel between the design of church buildings and the flow of Byzantine history

[31] See p. 310 below.

was evident to Middle Byzantine architects and their contemporaries. The amalgamation of divergent earlier forces in the Middle Byzantine period did not predetermine architectural forms; rather, the parallel should probably be explained by the fact that the architects who designed and developed inscribed cross churches were working within and responsive to the forces which generated Middle Byzantine history.

Architectural space, and space in general, may be described in terms of the directional awareness of the human body, which is reducible to three major axes passing through it, the vertical, the longitudinal, and the lateral. The vertical axis reflects the human body in upright position; the longitudinal reflects the direction of binocular vision when looking forward; the lateral is at right angles to the vertical and longitudinal. Two secondary axial directions are also important, the diagonals drawn 45° through the longitudinal and lateral. While the experience of every architectural space involves each of these axial directions, in many a single direction is emphasized: in a tower the vertical predominates, in a basilica the longitudinal is more important. In the geometry of the inscribed cross church all three axial directions and the secondary diagonals are emphasized, carefully balanced, but not equated. The vertical is emphasized by the drum and dome; the longitudinal by the vault of the nave and the apse; the lateral by the vaults of the cross arms. All axial directions, including the diagonals, are fused in the four columns under the dome; they accent the vertical in their upright forms, emphasize the longitudinal by framing the apse when seen from the entrance, and define lateral and diagonal directions when seen from the center of the building.

4. The Church Building and Monumental Images

Over 40 years ago Otto Demus investigated Middle Byzantine monumental art in its architectural context, with primary emphasis upon the images, rather than the buildings[32]. It will be useful to summarize his observations here, and to explore their impact upon the use of stereometric geometry in the architecture of the period.

It is, according to Demus, the primary aim of the frescos or mosaics "to represent the central formula of Byzantine theology, the Christological dogma, together with its implications in the organization and the ritual of the Byzantine church". The single underlying principle is defined as "the establishment of an intimate relationship between the world of the beholder and the world of the image". This was important because, according to the

[32] O. Demus, Byzantine Mosaic Decoration. London 1948.

doctrine evolved during the iconoclastic controversy, the relationship between the prototype and its image "is analogous to that between God the Father and Christ His Son". In accordance with Neoplatonic theory, the prototype is thought of as producing its image of necessity. "Thus the world itself becomes an uninterrupted series of *images* which includes, in descending order from Christ, the image of God, ... (Neoplatonic *ideas*), man, symbolic objects, and finally, the images of the painter, all emanating of necessity from their various prototypes and through them from the Archetype, God ... the worship accorded to the image ... is passed on through the image to its prototype."[33]

Demus states that the images "must occupy their due place in a hierarchy of values in which the image of the All-Ruler occupies the central and most elevated position (Fig. 26) ... A Byzantine programme ... needed a special framework ... the cross-in-square <inscribed cross> church ... The architectonic conception of a building developing downward <from the central cupola> is in complete accord with the hierarchical way of thought manifested in every sphere of Byzantine life, from the political to the religious, as it is to be met with in the hierarchic conception of the series of images descending from the supreme archetype."[34] [words in brackets < > added].

Three different but linked systems of interpretation are developed for the decorative schemes: 1. the church building as image of the cosmos, symbolising heaven and the terrestrial world in an orderly hierarchy descending from the cupola at the top to the lower parts of the church; 2. the church building as an image of topographic locations sanctified by Christs's earthly life; 3. the church building as an image of the chronological, recurring festival cycle as laid down in the liturgy[35].

The schemes are represented in three zones within the church building (Fig. 25, 26): 1. the cupola and apse, displaying only the most sacred persons (Christ, the Virgin, Angels) or scenes imagined as taking place in heaven, or in which heaven is a direct part of the action; 2. the major secondary vaults, which hold either the evangelists, or the cycle of feasts, including the calendar of the Christological festivals (life of Christ), in which the topography of the church building becomes a magical counterpart of the Holy Land; 3. wall niches and lower wall surfaces, depicting single figures as the "Choir of Saints" including apostles, martyrs, prophets, patriarchs, and holy

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[33] *Ibid.* 5f.
[34] *Ibid.* 10–12.
[35] *Ibid.* 15f.

monks in hierarchical order, but also in an order developed from the liturgical calendar[36].

In the first zone eternal dogma, rather than any sort of transient action is displayed, not depicted, as magical reality beyond time and causality. The middle zone contains depictions of historical events which are at the same time iconic representations belonging to the cycle of the holy year; they are half narrative picture and half eternal representation. In the lowest zone the communion of All Saints is realized as the sum of single figures represented within the framework of the church building.

Demus points out that the veneration accorded the images requires them to face the beholder, "that is, they must be represented in frontal attitude". In a scenic image the desired frontality was in conflict with the depiction of action; this problem could, however, be effectively resolved by letting the figures confront each other not, as in Western art, within an imaginary pictorial space, but rather, across the real space of the building, by properly relating the images on curved or opposing surfaces (Fig. 26)[37].

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Demus' observations make it perfectly clear that Middle Byzantine frescos and mosaics were not, in the usual sense, decoration. While architectural decoration often contributes significantly to the total composition and to the visual success of a building, in Middle Byzantine examples the architecture and the images which adorn it are uniquely inseparable parts of a single conception. The images are displayed by necessity as requirements of Middle Byzantine theology. The geometric components of the church building, together with the representations were the medium for meeting these requirements. The images and their hierarchical relationships are most effectively displayed and best understood at the monumental, architectural scale of the inscribed cross church building. More important, the configuration of the architecture, combined with the images, represents the physical realisation of the theological system in a manner which could hardly have been displayed otherwise. The symbolism of the inscribed cross church interlocks with the meanings inherent in the images. The total unit, the architecture together with the images, is indeed greater than the sum of the parts. With its monumental decoration the inscribed cross church is far more than a place of worship: it is an iconic and symbolic statement concerning the fundamental dogmas and beliefs of Middle Byzantine civili-

[36] *Ibid.* 16–29, *passim.*
[37] *Ibid.* 7–10.

sation. Without its fresco or mosaic decoration the Middle Byzantine church building, unlike church buildings in the West, is literally incomplete.

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Given the necessity of enhancing the church building with images, the particular style of fresco and mosaic representation developed by Middle Byzantine artists was imperative for making the geometric components of the architecture visually effective. This particular style of figure representation permits a clear reading of the geometry.

The style of Middle Byzantine representation created images which do not suggest space *behind* the architectural surface upon which they appear; rather the images remain *within* the surface (Fig. 25–27). Because the depiction of natural lighting, shadows, atmospheric density, and perspective foreshortening are largely avoided there is no illusion of space developing behind the picture plane. Figures are not shown naturalistically, but rather, take on simplified geometric forms, as do the folds in the robes they wear (Fig. 27)[38]. The images do not, in contrast to those of Classical Antiquity or Western art from the 15th century to the early 20th, visually break through and interrupt the surface of the architecture. As a result, the figures which are represented define, rather than destroy the architectural surfaces they decorate; their style preserves the integrity of the geometry of which the architecture is composed.

The exact opposite is true in Western monumental painting after the Middle Ages. In the scenes painted on church walls and vaults, for instance, by Michelangelo, Pozzo, or Tiepolo one objective of the artistic style is the apparent elimination of surfaces within the church building. With the aid of perspective foreshortening, lighting effects and the depiction of atmospheric density the objects painted upon the walls and vaults appear to be located in an imaginary space which seems to extend the real space within the building.

Nevertheless, both in Middle Byzantine and Western churches the objective of the artistic style is the same: the establishment of a direct and immediate relationship between the beholder and the sacred images. In Western examples the immediacy is achieved by creating the *illusion* that the sacred images share the same space as the beholder: the beholder, in his mind's eye, is transported into the imaginary space of the sacred images, beyond the earthly limitations of the building. Emphasis here is not on the

[38] *Ibid.* 30–39 discusses methods used by Middle Byzantine artists to suppress spacial illusion.

physical reality of architectural space, which is frequently no more than a vehicle for the creation of perspective illusions, but rather, upon the painted space which appears to open up outside the tangible space of the building.

In Middle Byzantine churches, to the contrary, immediacy is obtained because the beholder and the sacred images *actually* share the same space. Space does not appear to develop illusionistically about the image. The space of the sacred image is in front of it: it is the architectural space of the church building. The spacial devices, for instance, opposing persons in the same composition across the real space of the church (Fig. 26)[39], were employed not only to convey narrative action, but also, to convince the beholder that sacred images *actually* participate in the space of the building, which is the space in which the beholder stands. The small, jewel-like scale of inscribed cross churches also contributes significantly to the direct and immediate confrontation between image and beholder[40]. In Middle Byzantine examples emphasis is upon tangible internal architectural space, the precisely defined geometric form of the building; it is immensely important because it is the space not only of the beholder, but also of the sacred images. The church interior is the shared, common meeting ground between the most important representations of church dogma and the Christian beholder they address[41].

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It may be argued that the clear stereometric geometry and flat, undecorated character of the architectural forms inside inscribed cross churches was developed to provide surfaces suitable for the presentation of the required images.

Certainly the images would have been less effective, within the total composition of the church interior, if architectural surfaces had been plastic-

[39] O. Demus, Byzantine Mosaic Decoration 9f.

[40] See also p. 305 above and fn. 27. The argument presented here becomes particularly vivid in a comparison between the impact of mosaic representations in a Middle Byzantine church, for instance Daphni (Fig. 26), with that experienced in an early Byzantine basilica such as *Sant' Apollinare Nuovo* in Ravenna. The structural and demographic reasons sometimes given for the small size of Middle Byzantine churches (for instance C. Mango, Byzantine Architecture 97) are no doubt relevant but other, less tangible reasons may be equally valid. Numerous reasons may be found for a single phenomenon, all perhaps equally relevant. I believe that if Middle Byzantine architects and patrons had wanted to build larger churches they would have found the structural techniques and materials to do so, whether or not the congregations were large enough to fill the buildings. Other reasons for the small size of the churches not relevant to the present discussion may also be adduced.

[41] Demus, *Ibid.* 13f.

ally decorated with carved friezes, coffers, ribs or other embellishments. However, Middle Byzantine church forms are too complex, and too sophisticated to be viewed only as vehicles for the representation of holy images. If the display of images had been the primary concern, then we would expect the architecture to be more simple and unobtrusive, composed for the most part of large plain surfaces without other strong and convincing attributes; the box-like *Capella Scrovegni* in Padua, with its important 14th century fresco cycle by Giotto, would then appear to be an ideal architectural setting. On the other hand, the richly spacial, rarely stereometric, ornately three dimensional forms of Baroque churches in 18th century Italy and southern Germany served as excellent vehicles for painted representations of holy images, although, as we have seen, in a very different style. The use of clear, easily grasped stereometric geometry is not a prerequisite for the display of sacred representations.

The crisp, stereometric geometry of the inscribed cross church was not developed as a vehicle for the display of sacred images any more than the fresco and mosaic programs were developed to decorate inscribed cross churches. Rather, both developments were inextricably linked. Exactly how the interdependence of architecture and representation developed has not been adequately explored, and may never be fully understood because of the lack of extant monuments. Nevertheless, it seems clear that the monumental Middle Byzantine fresco and mosaic programs as we know them could not have been developed without reference to the building forms to which they were applied, and it is equally clear that the stereometric geometry of inscribed cross churches is so well attuned to the decorative programs, that their application must have been considered, either when the inscribed cross system was being developed, or when it was chosen as the standard church solution.

It is not the purpose of this paper to attempt to determine how architecture and figure representation mutually influenced each other during the obscure period when Middle Byzantine forms evolved. Nevertheless, the following observations are relevant: 1. O. Demus has traced the evolution of the Middle Byzantine decorative system to the 9th century, after iconoclasm, but with significant stylistic contributions during the late 6th, 7th, and 8th centuries[42]; 2. ribbed 6th century domes such as those of St. Sophia in Constantinople[43] and Basi-

[42] *Ibid.* 43–73.

[43] C. MANGO, Byzantine Architecture, paperback ed. 59–68, fig. 84–88 with further

lica B in Philippi[44], and lobed domes such as those of St. Clement in Ankara (7th century?)[45] and the *Myrelaion* in Constantinople (9th century)[46] are poorly suited for application of the large central images of standard Middle Byzantine decorative schemes; 3. the earliest surviving church domes with unarticulated interior surfaces are those of St. Eirene in Constantinople (740) (Fig. 18)[47], the Fatih Camii in Zeytinbagi (Tirilye, Trigleia) (9th century?)[48] and St. Sophia in Salonica (780–787, perhaps after 783?)[49]; 4. the earliest known example of the inscribed cross type may be Church H in Side, perhaps built in the 7th century[50]; 5. while dated monuments are sparce, the development of church architecture, unaffected by iconoclasm, appears to have progressed steadily through the 8th and 9th centuries, in contrast to the evolution of monumental church decoration, which was interrupted by the schism concerning the use of images.

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references; R. L. VAN NICE, St. Sophia in Istanbul, an Architectural Survey. Washington D.C. 1965ff., *passim*.

[44] P. LEMERLE, Philippes et la Macédoine orientale. Paris 1945, part 2, Basilique B ou Direkler, pl. 66–67, 78–80 and *passim*.

[45] P. G. DE JERPHANION, L'église de Saint-Clément à Angora. *Mélanges de l'Université Saint-Joseph* 13 (1928) 113–143; H. BUCHWALD, The Church of the Archangels in Sige near Mudania. Vienna, Cologne, Graz 1969, *passim* for stylistic chronological evidence and a possible date for the building in the 7th century.

[46] C. L. STRIKER, The Myrelaion (Bodrum Camii) in Istanbul. Princeton 1981, *passim*, fig. 6, 15–19, 47, with references to earlier publications and discussion of the dedication and chronology.

[47] U. PESCHLOW, Die Irenenkirche in Istanbul, Untersuchungen zur Architektur. Tübingen 1977, *passim*, particularly 26, 206–220, pl. 4, attachment 3, with a discussion of chronology, construction, and references to earlier publications.

[48] See footnote 30 above.

[49] K. THEOCHARIDOU, The Architecture of Hagia Sophia, Thessaloniki. *BAR International Series* 399. Oxford 1988, *passim*, particularly 35–46, 148–155 attributes the dome to phase B, which she dates around 690; in H. BUCHWALD, The Church of the Archangels in Sige near Mudania. Vienna, Cologne, Graz 1969, 43 I suggested that the church was constructed between 780 and 787 based upon the evidence of the mosaics in the apse and their inscription, assuming that the church was, on the whole, of a single construction period; C. MANGO, Byzantine Architecture. Paperback ed. 89 suggests that the church commemorated the victory over the Slavs in 783.

[50] S. EYICE, L'église cruciforme byzantine de Side en Pamphylie. *Anatolia* 3 (1958) 35ff.; H. BUCHWALD, Western Asia Minor as a Generator of Architectural Forms in the Byzantine Period, Provincial Back-wash or Dynamic Center of Production? *JÖB* 34 (1984) 226f. for a discussion of the evidence, possible date and further references.

5. Platonic Architecture?

Rudolph Wittkower was the first architectural historian who seriously and extensively explored the relationship between the use of the harmonic musical scale in the proportional schemes of buildings and philosophical systems[51]. Concentrating upon the Renaissance, his work relates 15th and 16th century architectural proportions directly to Platonic, and ultimately to Pythagorean theory. Reduced to its simplest form, the theory states that the proposed mathematic structure of the universe is reflected in the harmonic musical scale, which may be reproduced on cords related in length as 1:2:3:4. The inferred implication is, that if the musical scale reflects the mathematical proportions which underlie the creation of the universe, then certainly churches, and perhaps all buildings, should be designed employing those numeric relationships.

With Neoplatonism the theory appears to have entered early Byzantine thinking. The writing of Pseudo-Dionysius, Augustine, and Boethius reflects Neoplatonism, including the relationship between architecture, music, and harmonic numeric proportions[52]. It is therefore not surprising to find churches of the 4th, 5th, and 6th centuries designed using harmonic musical proportions to regulate the dimensions of major features.

On the other hand, the evidence is circumstantial. It would be reassuring, for instance, to learn of references and reasons, in written sources of the Byzantine period, for the application of harmonic proportions to the design of buildings. At present the most convincing evidence is to be found in the ratios of the dimensions of the buildings, because the texts refer to abstract, rather than tangible relationships between architecture, music, and mathematics. If we had only the written sources, and not the evidence of the buildings, we would justifiably be sceptical concerning the application of harmonic numbers to early Christian buildings. Moreover, the following questions arise: 1. Why were harmonic musical proportions used in the dimensions of some, but apparently not all Christian basilicas? 2. Why were

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[51] R. Wittkower, Architectural Principles in the Age of Humanism. London 1949; revised 1962; New York 1971, *passim* and particularly 103f., 117–126; 162–166 provides notes on the vast bibliography concerning proportional systems in architecture. – H. Kaiser, Lehrbuch der Harmonik, Zurich 1950, *passim*, particularly 109–120. – P. v. Naredi-Rainer, Architektur und Harmonie. Cologne 1982, 11–21 and *passim* outlines the theoretical evidence in an easily comprehended manner but overstates its applicability to actual examples.

[52] The evidence is summarized in P. v. Naredi-Rainer, Architektur und Harmonie, 19 with further references; H. Hunger, Reich der Neuen Mitte. Graz, Vienna, Cologne 1965, 113f., 315–334, 362–369.

different proportional schemes used in some buildings? Several answers come to mind, but all remain speculative, until further research achieves firmer ground concerning the methods and theories used to design early Christian buildings.

* *
*

I believe that there are also other, perhaps even more intriguing possibilities, when considering the use of Platonic theory in Byzantine architecture, which have not, to my knowledge, been explored. While they are hypothetical, there is evidence to support them.

We have seen that the central and highest feature of an inscribed cross church is the dome, which is reserved for the display of the most sacred images of Middle Byzantine church dogma; these images stand at the apex of a hierarchy of religious representations. The dome may be understood as a symbol of heaven; it is not only architecturally, but also symbolically and theologically the most important feature of the building. According to Platonic theory, it may also be thought of as the most perfect form of the building, because it is a hemisphere, and the sphere is the most perfect form, the form of the universe[53]. While other reasons also existed, the sphere as it occurs in Platonic theory may therefore have been considered, on the one hand, in the design of the inscribed cross church, and on the other hand, when the Middle Byzantine decorative program was applied to it.

The use of other spherical surfaces for the depiction of important images corroborates these observations: the image of the Virgin was usually located in the apse, a quarter sphere, and the evangelists were often represented in the pendentives, which are spherical triangles. There is a descending order of importance in the images depicted which concurs with a descending order of completeness in the spherical forms to which they were applied: hemisphere, quarter sphere, spherical triangle: the more complete the sphere, the more perfect the form.

Platonic theory can be extended by assuming that the cylinder, which resembles the sphere in cross-section, is more perfect than forms which do not resemble spheres, even though Plato makes no such assertion. In inscribed cross churches a cylinder, the drum, supports the central hemisphere, the dome, and half cylinders, the major cross arm vaults, support a full cylinder, the drum of the major dome; another half cylinder supports a quarter sphere, the conch of the apse. A Platonic hierarchy of geometric

[53] PLATO, Timaeus, 44, 62f.

components may therefore be discerned in the architecture of the inscribed cross church which concurs with the representational hierarchy of the Middle Byzantine decorative program. Two criteria which control the hierarchical positions of geometric components may be adduced: 1. the sequence extending from the sphere through the cylinder to rectangular shapes; 2. the degree of completeness of each geometric form. The location of preeminence was the highest point of the church in the center of the building, but a second point of eminence was the conch of the major apse. While other criteria were certainly also used in the choice and development of architectural forms, the relative importance, within a supposed Platonic hierarchy of geometric components, may have been considered.

Extending Platonic theory even further, if the sphere is the most perfect form, by analogy the square is the most perfect rectangle and the cube is the most perfect prism[54]. These observations may be relevant for understanding why the *quadratura* and other forms which can be developed from squares or cubes may have been used as underlying features of some Middle Byzantine churches. At another level, similar concepts may have given impetus to the use of geometric forms such as regular polygons, star shapes, and other configurations organized about a center or a multi-axial system in Middle Byzantine carved stone church furnishings, even though several other sources for these forms must also be considered.

Whether or not such a hierarchy of geometric forms was actually intended in the design of Middle Byzantine churches, the importance of the sphere can be extended in still another, perhaps even more intriguing direction. If the sphere is the most perfect form, then its stereometric attributes must be made clear and visible, in order to achieve a perfect building. Nothing should disturb the clarity of form, no coffers, no ribs, no other articulation. By extension, the same is true for all other forms of the building, whether or not they are spherical. By analogy with the sphere, simple, regular geometric forms will be preferred for each member. It seems to follow that perfect architecture will be achieved by clearly displaying the stereometric attributes of each part of the building. According to this line of thought perfection, in "Platonic architecture", is achieved by a perfect combination of simple stereometric forms. The inscribed cross church appears to fully meet this requirement.

It may be possible to extend the term "Platonic architecture" even further when considering Middle Byzantine churches. One of the central

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[54] Plato does not give priority to the square and cube; in PLATO, Timaeus, 53ff. the properties of various geometric configurations are discussed.

theses of Platonic thought is the distinction between the unsatisfactory transitory world of the senses on the one hand, and the eternal truth of logic and mathematics on the other. While all features of this world, including buildings, are transitory by nature, certainly the goal of designing churches to be as close as possible to the world of eternal truth and logic must be desirable. That goal can clearly best be achieved by architectural forms which are the products of logical, mathematical consideration, the forms of stereometric geometry. The inscribed cross church may therefore be understood as a Platonic statement employing mathematically rational forms which are related to each other according to a logical, eternally valid system. While it is obviously impossible to construct a building as a Platonic *idea*, perhaps designing it in terms of stereometric geometry was thought to be as close as one could come to that distant and unreachable goal.

* *
*

Probably none of the proposed interpretations can be founded upon textual evidence, because Middle Byzantine architects, in stark contrast to those of recent times, did not write articles, books or treatises concerning their buildings and the architectural theory behind them. Several admittedly speculative comments concerning the credibility of the suggested hypotheses may nevertheless be useful.

It is hardly necessary to point out that Plato and Platonic theory were known during the Middle Byzantine period[55]. While we know almost nothing about the architects who designed Middle Byzantine buildings[56], some may have been educated in philosophy, mathematics and geometry, or may have had contact with educated persons. It is possible that at least the most sophisticated architects and patrons understood and enjoyed contemplating the proposed Platonic implications of their church buildings. Demus stresses the importance of Neoplatonic thought for the development of Middle Byzantine monumental representation[57]; according to the interpretations presented above Neoplatonic thought may have played an

[55] For instance HUNGER, Reich der Neuen Mitte, particularly 362–369; C. MANGO, Byzantium, the Empire of New Rome. London 1980, 138–148, both with further references.

[56] Throughout this paper I use the term *architect* in today's sense, as the person responsible for the *design* of a building, regardless of what he was called in Byzantine times, or how he was trained; he may not always have been responsible for construction of the building he designed. C. MANGO, Byzantine Architecture. Paperback ed. 14–19 for a review of information concerning architects and builders of the Early Byzantine period.

[57] P. 310 above; O. DEMUS, Byzantine Mosaic Decoration 6f., with further references.

equally important role in the formulation of contemporary church architecture.

On the other hand, it is not essential that the architects or their patrons were aware of the Platonic implications of the architectural forms they created. Modern architectural theory was, at least to a considerable extent, based ultimately upon rationalist theorists of the 18th century who were neither read nor even known by name in the 1920's, when the tenets of Modern architecture were set forth. In a similar manner, it is possible that architectural theories postulated in Late Antiquity were handed down, among architects, through generations, whether in texts or, more likely, by word of mouth[58]. While one part of the theory, the goal of designing buildings in terms of stereometric geometry, may have endured through centuries, other aspects, such as the foundation of the theory upon Platonic thought may either have been suppressed to meet theological demands, or lost in the course of time, perhaps because Plato was no longer important. For most architects the method of achieving perfection, stereometric geometry, may have been of primary interest while the reason for doing so, Platonic theory, may have seemed irrelevant.

Finally, I wish to stress that Plato does not in any way suggest the use of stereometric geometry in architecture. The applications of Platonic theory to architecture postulated above, if they are valid, must have been proposed by architectural theorists during Late Antiquity or in the Byzantine period. Vitruvius, writing in the time of Augustus, says almost nothing concerning Plato and makes no mention of the use of stereometric geometry outlined in this paper; the architectural forms and systems he describes are as far removed as we can imagine from those of medieval Byzantine architecture[59]. In the 3rd century Neoplatonism could have given impetus to the

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[58] Architectural practice, the technology of building design and construction, was handed down through generations. Some architectural theory must have accompanied practical training even at an everyday level, and more sophisticated theory must have existed in more sophisticated centers of production such as Constantinople. C. MANGO, *ibid.* for the distinction between persons who *designed* buildings and those who *constructed* them in examples of the Early Byzantine period; in the vast majority of medieval Byzantine buildings there is no reason to believe that such a dichotomy existed, although it could have, at least in some instances. J. J. COULTON, Greek Architects at Work, Problems of Structure and Design. London 1977, 1–29 reviews the role of the architect, his methods and training in the Classical period.

[59] Vitruvius, The Ten Books of Architecture. Morris H. MORGAN transl. Cambridge MA 1914, unabridged ed. New York 1960, Bk. 1 Ch. 2; Bk. 3 Ch. 1 stresses the use of proportions based upon those of the human body, states that the number 10 was held, by Plato, to be perfect because it contains the individual units called by the Greeks *monades*, and discusses

development of architectural theories based upon interpretations of Plato. The use of strong simple stereometric forms at the outset of Christian monumental architecture, during the reign of Constantine, could be a first reflection of the impact of Platonic thought upon architectural theory[60].

Note: All illustrations and photographs are by the author unless stated otherwise in the caption.

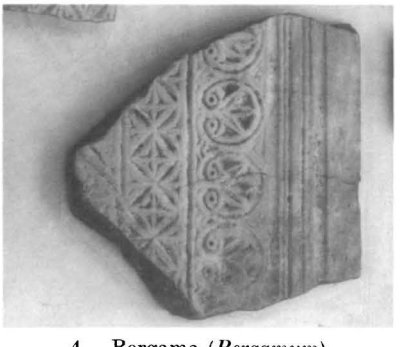
several numeric relationships; Bk. 3 Ch. 3, 5, Bk. 4 Ch. 3 describes modular systems of proportions for temples and discusses beauty, which depends upon the subjective, visual impression of buildings and their components rather than upon absolute, eternal relationships or upon the mathematic structure of the universe; Bk. 6 Ch. 2, 3 provides proportions for dwellings which appear to be more rules of thumb for obtaining useful and pleasing spaces than formulas for assuring eternal validity.

[60] In H. Buchwald, The First Byzantine Architectural Style, Evolution or Revolution? *JÖB* 32/5 (1982) (Akten XVI. internationaler Byzantinistenkongreß II/5) 33–45; *idem*, Der Stilbegriff in der byzantinischen Architektur. *JÖB* 36 (1986) 303–316 I attempted to define the stylistic character of early monumental Byzantine architecture, which appears to prepare the way for the forms described in this paper.

1. Bergama (*Pergamum*).
Archeological Museum (No. 335?).
Closure Slab Fragment (1965)

2. Bergama (*Pergamum*).
Archaeological Museum (No. 348).
Closure Slab (1965)

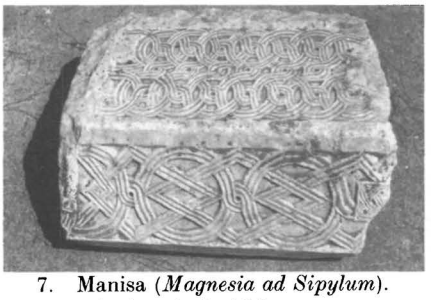
3. Bergama (*Pergamum*).
Archaeological Museum (No. 349).
Altar Screen Lintel (1965)



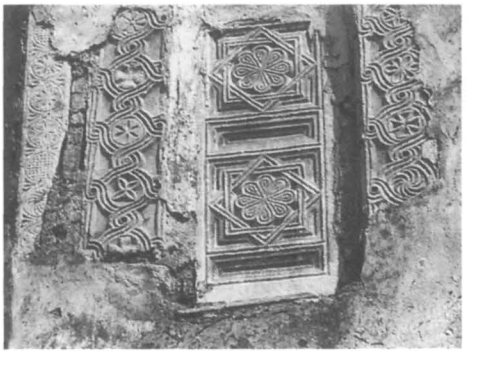
4. Bergama (*Pergamum*).
Archaeological Museum (No. 1979).
Closure Slab Fragment (1965)

5. Manisa (*Magnesia ad Sipylum*).
Archaeological Museum.
Altar Screen Lintel (1975)

6. Manisa (*Magnesia ad Sipylum*).
Archaeological Museum.
Altar Screen Lintel (1975)

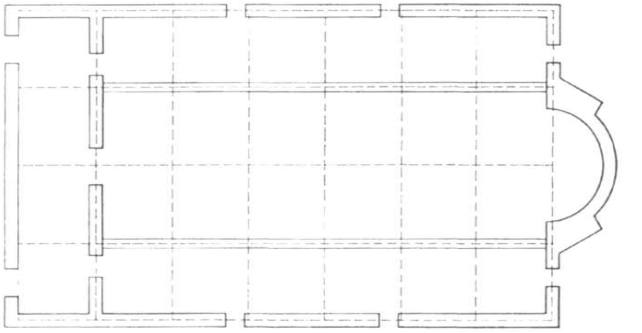


7. Manisa (*Magnesia ad Sipylum*).
Archaeological Museum.
Altar Screen Lintel? (1975)

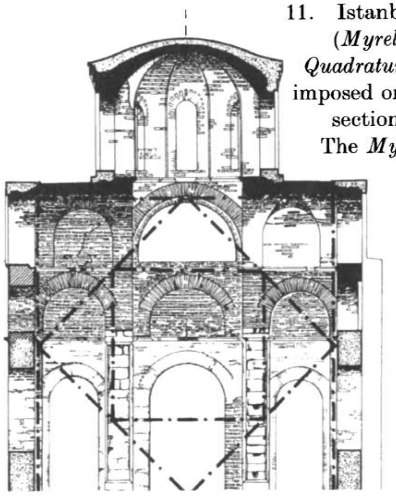


8. Tarahala. Middle Byzantine carving reused in the walls of the upper Mosque

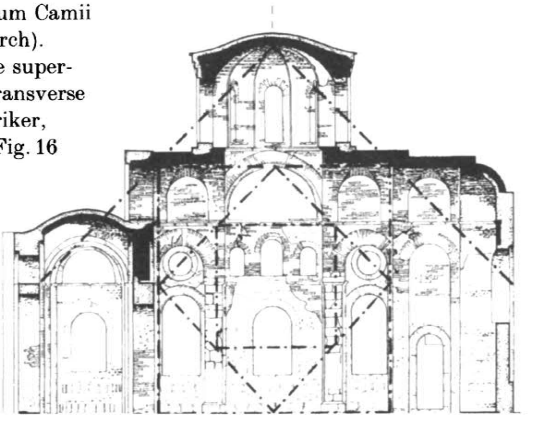
9. Istanbul. Eski Imaret Camii (Church of Christ *Pantepoptes*). East bay of the south facade (1960) before the recent restoration



10. Modular Grid Superimposed upon the Plan of Church EA at Sardis.
By permission of *The Archaeological Exploration of Sardis*

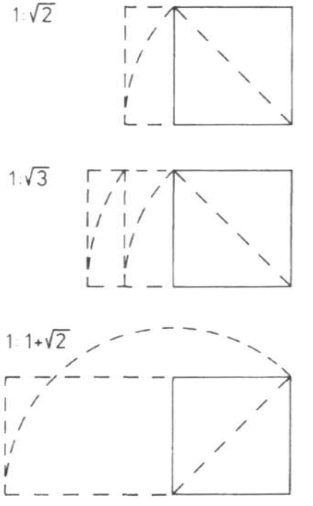


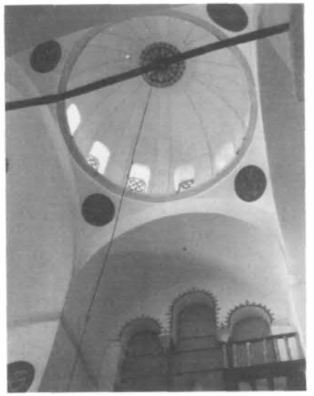
11. Istanbul. Bodrum Camii (*Myrelaion* Church). *Quadratura* scheme superimposed onto the transverse section in L. Striker, The *Myrelaion*, Fig. 16



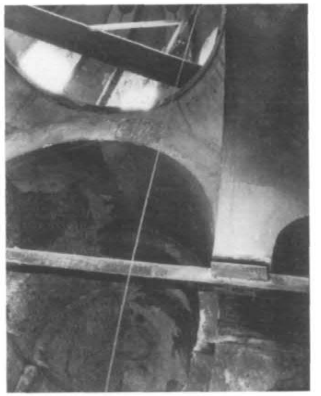
12. Istanbul. Bodrum Camii (*Myrelaion* Church). *Quadratura* scheme superimposed onto the longitudinal section in L. Striker, The *Myrelaion*, Fig. 17

13. Construction of rectangles with sides proportioned $1:\sqrt{2}$, $1:\sqrt{3}$ and $1:1+\sqrt{2}$

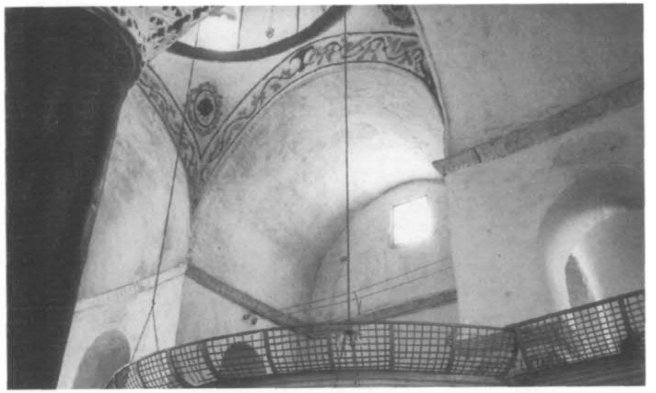




14. Istanbul. Eski Imaret Camii (Church of Christ *Pantepoptes*). Interior looking west (1960). The wooden gallery, whitewash and ornamentation are later additions

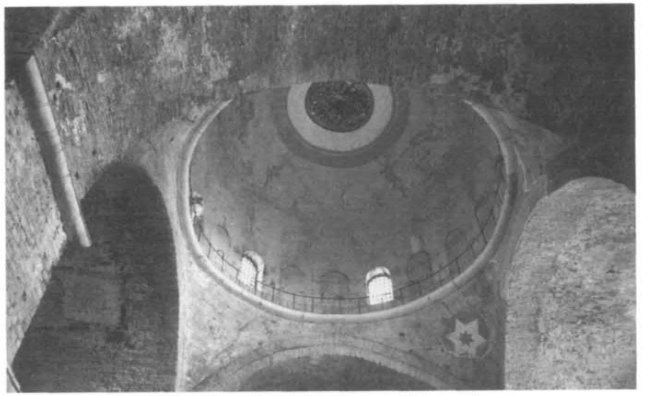


15. Istanbul. Ahmet Paşa Camii (Church of St. John in Trullo?). Interior during restoration looking east (1960)



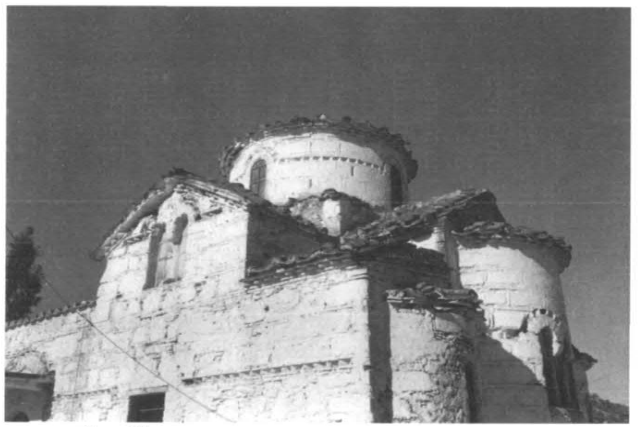
16. Zeytinbagi (Tirlye, Trigleia). Fatih Camii. Interior looking west (1965). The wooden gallery, whitewash and ornamentation are later additions

17. Zeytinbagi (Tirilye, Trigleia). Fatih Camii. Interior looking northeast (1965). The whitewash and painted ornamentation are later additions



18. Istanbul. Church of St. Irene. Major dome (1975). The painted decoration is a later addition

19. Zeytinbagi (Tirilye, Trigleia). Fatih Camii. Exterior from northwest (1965)

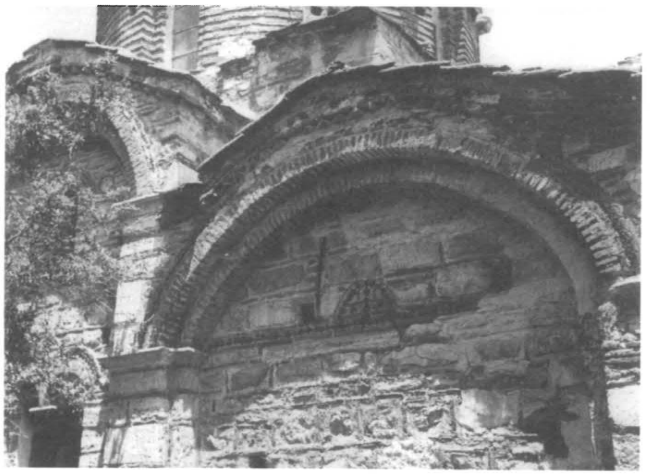


20. Skala (Peloponnesus). Church of St. George. Exterior from southeast (1974)

21. Istanbul. Ahmet Paşa Camii (Church of St. John in Trullo?). Exterior.

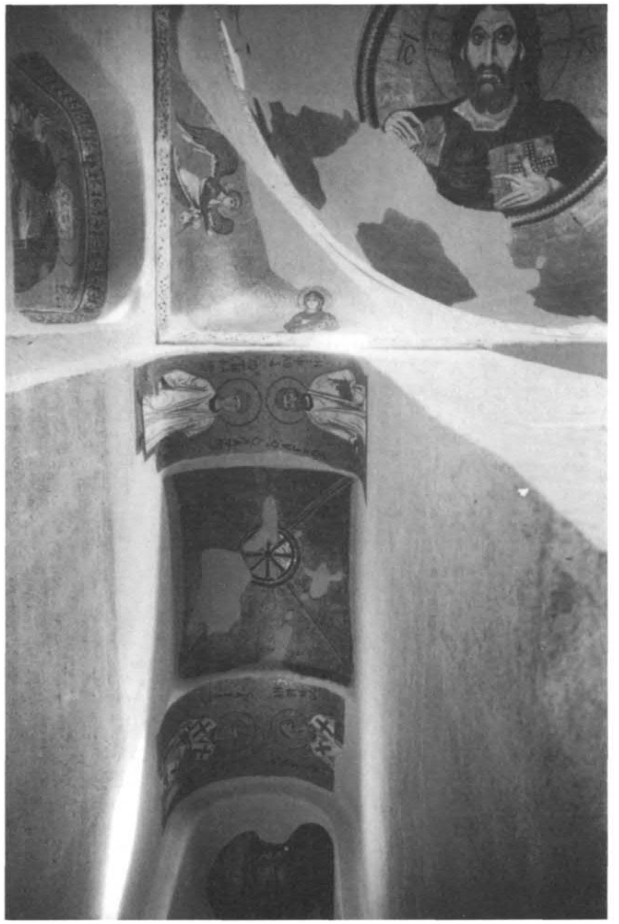
22. Istanbul. Fethiye Camii (Church of St. Mary *Pammakaristos*). Exterior from southeast (1960)

23. Zeytinbagi (Tirilye, Trigleia). Kemerli Kilise. Apse Detail (1965)

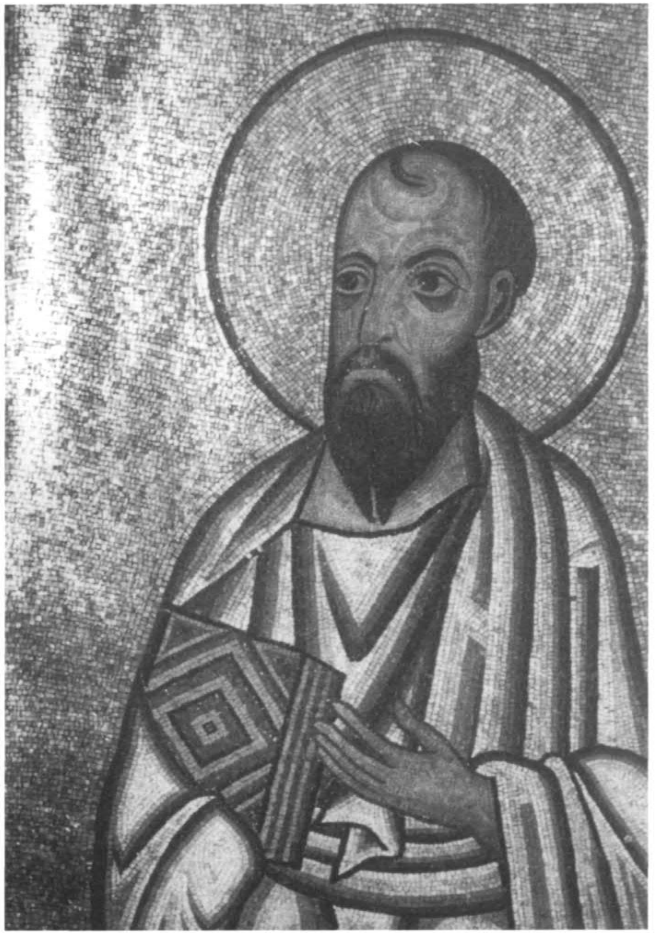


24. Pyrghi (Chios). Church of the Holy Apostles. South Facade Detail (1960)

25. Phocis. Hosios Lukas *Katholikon*. Apse and *bema* looking up



26. Daphni. *Katholikon*. Major dome, northeast pendentive and north apse looking up



27. Phocis. Hosios Lukas *Katholikon*. Mosaic detail

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